Canadian Environmental Advisory Council
Conseil consultatif canadien de l'environnement

***Canadian Environmental Advisory Council***

# Canada and Sustainable Development

**December 1987**

Canada

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Council

# Canada and Sustainable Development

A Commentary on Our Common Future, the Report of
The World Commission on Environment and Development
and its Implications for Canada

Enquiries concerning the work of the Council and requests for Council publications should be addressed to:

The Executive Director
Canadian Environmental Advisory Council
c/o Environment Canada
Ottawa, Ontario
K1A 0H3

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## ROLE OF THE CANADIAN ENVIRONMENTAL ADVISORY COUNCIL

The Canadian Environmental Advisory Council (CEAC) is a body representing a cross-section of Canadians who are knowledgeable and concerned about the environment. It operates in a confidential advisory capacity to the Minister of the Environment. It provides the Minister with an alternative to the advice provided by the Department of the Environment and other federal agencies, and to the advice of specific interest groups. Council's public role, in terms of activities such as the publishing of reports, is therefore secondary to its primary function of providing advice to the Minister of the Environment.

## ACKNOWLEDGEMENTS

The present document sets out the results of a review undertaken by the Canadian Environmental Advisory Council of **Our Common Future,** the Report of the World Commission on Environment and Development (WCED). This review was requested by the Federal Minister of the Environment, the Honourable Tom McMillan, in order to assist the preparation of Canada's response to the Report, and to provide material which could be used in the discussion of the Report at the General Assembly of the United Nations.

The Council itself commissioned the preparation of two background papers to provide a basis for a discussion with the Minister held during its special meeting on August 19-20, 1987. Those papers, prepared by David B. Brooks and Ted Schrecker, have been reproduced as annexes to the present statement. While the Council commissioned them and has used them as references for discussion purposes, they do not necessarily reflect its own views.

All members of the Council participated in the discussions and contributed to preparation of the present statement. The Chairman and Vice-Chairpersons, Dr. Robert J.D. Page, Dr. S.A.M. Conover and Dr. J.S. Rowe, served as a steering group throughout the project. Mr. Jamie Benidickson was retained by Council throughout the project and served as the principal composer of Council's statement.

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## EXECUTIVE SUMMARY

The publication of **Our Common Future** by the World Commission on Environment and Development (WCED) is an important opportunity for Canadian policy-makers to focus their attention on the environmental concepts and principles which form the continuing basis of all human social and economic activity. The WCED's recommendation for a global effort to achieve **sustainable development** should stimulate action to strengthen Canadian environmental protection measures and management procedures.

The way in which Canada responds to the WCED will be particularly important because this country took the lead at an early stage in encouraging international recognition of environmental concerns. The degree of seriousness with which Canada pursues sustainable development in the domestic context will significantly affect its credibility abroad and consequently its ability to promote the adoption of improved environmental and resource management practices elsewhere.

CEAC agrees with the WCED that improved practices are essential, because environmental deterioration and resource depletion are now proceeding on a global scale and at an accelerated pace, with adverse consequences for all countries. Threats to human health and national security are becoming increasingly evident and economic dislocation can be expected.

CEAC believes that Canada's reaction to **Our Common Future** should be focussed on three areas of long-term environmental interest. It should, however, be emphasized at the outset that, in making its recommendations, CEAC is mindful of the immediate economic and social problems of developing nations as described by the WCED. The focus it has chosen is determined by its responsibilities as an advisory body and the particular standpoint which those responsibilities make possible.

Attitudes to the Environment: Sustainable development will not be realized if there is no change in the popular perception of the natural environment as a limitless storehouse of wealth for human consumption. What is required is nothing short of an alteration of mindset.

Recognition of the ecosphere as the home of humankind, and of other species, operating in accordance with its own integral processes, should be encouraged through comprehensive public education measures. These might include curriculum development for schools, adult information programmes of all kinds, and environmental management training for public servants and private sector employees. A "Decade of the Environment", if appropriately planned and financed, could contribute significantly to greater public awareness of sustainable development.

As a means of directing political attention to sustainable development issues, CEAC urges that a series of conferences and meetings be organized. We recommend:

- a televised two-day national summit on the economy and the environment;

- a circumpolar conference on arctic marine, wildlife and environmental management, hosted by Canada;

- active Canadian participation in a global conference on sustainable development.

**Information and Environmental Analysis:** There is a need for understanding of the environment and man's interaction with it, based on both the natural and the social sciences. This is the essential foundation for all aspects of effective environmental management - from resource allocation to compliance mechanisms.

Research in environmental science and related areas of the social sciences should be characterized by continuity, international compatibility, and promising interdisciplinary approaches. Strategic grants for environmental research would be highly desirable. Recent initiatives in state-of-the-environment reporting should be encouraged, and particular attention must be devoted to the demanding task of integrating environmental understanding into the process of government policy-making and follow-up monitoring. As CEAC has stated elsewhere, comparative data, both on environmental standards and regulations and on management programmes, must be accumulated and used for the purpose of defining effective avenues for legislative development.

Environmental principles must be incorporated into all aspects of government policy, including trade, regional development and foreign relations. To this end research into economy/environment linkages will be necessary and it should be facilitated by strengthening the economic analysis capability of the Department of the Environment.

**Institutions:** Within government and industry, organizational re-structuring is required to ensure that all agencies undertaking economic development projects assume responsibility for the environment at the earliest stages. The addition of the Minister of the Environment to the Priorities and Planning Committee of the Cabinet would be useful in this respect.

If the widely supported concept of trust obligations to future generations is to influence contemporary conduct, structural innovations in government will be required. It is essential to establish procedures of surveillance and independent review so that present governments can be held accountable for the consequences of their programmes and policies. The creation of an Environmental Council for Canada, or possibly the appointment of an auditor general for the environment, appear to offer means of strengthening accountability.

Through the UN and its agencies, and through the medium of bilateral and multilateral negotiations, Canada - as a middle power with a long-term interest in better environmental management on a global scale - should work to further the principles of sustainable development. The introduction of environmental assessment into Canada's international assistance programmes is a worthwhile initiative in this regard.

In summary, for the purpose of achieving sustainable development in Canada, CEAC recommends an extended federal and provincial programme, which might take the form of a "Decade of the Environment", incorporating the following initiatives:

- strategic grants for environmental research and continued efforts to refine, and make better use of, state-of-the-environment reporting;

- comprehensive curriculum and public education measures designed to raise general awareness of the principle of sustainable development;

- a national summit on the economy and the environment, a circumpolar conference on arctic environmental management, and active Canadian participation in a global conference on sustainable development;

- the development of an economic analysis capability within Environment Canada and the addition of the Minister of Environment to the Priorities and Planning Committee of the federal Cabinet, together with equivalent measures in the provincial sphere;

- incorporation of environmental principles into all aspects of government policy including trade, regional development and foreign relations;

- implementation of structural changes to ensure the accountability of federal and provincial governments for the environmental consequences of their programmes and policies;

- continuing efforts to encourage the adoption of long-term environmental management principles by other countries, including countries receiving Canadian international assistance.

## PREFACE

During the past few years, the Canadian Environmental Advisory Council has made the relationships between the environment and the economy one of the main themes in its programme of studies and reviews. Some of this previous work has provided the basis for the Council's review of the Report of the World Commission on Environment and Development. A brief reference to some of the earlier studies and reports will illustrate the development of the Council's approach to this subject.

In its submission in 1983 to the Royal Commission on Economic Union and Development Prospects for Canada, the Council expressed the view that "a direct linkage exists between the long-term health of both the economy and the environment. In Canada they are essentially one. We have an economy that is primarily resource-based and thus environment-based. Impair the environment and you impair the economy." The Council went on to say that our economy must conform to ecological reality; that it is influenced by the constraints and capabilities not only of local but also of regional and global life support systems; and that economic activities must be sustainable in the long term. In many respects these views were accepted by the Macdonald Commission, and they are reflected in the Commission's report (Chapter 13, **The Environment, Society and the Economy**).

The Council began its first attempt at an in-depth examination of the connections between the environment and the economy in 1984. The results of the study were published in 1985 under the title **Examining Environment-Economy Linkages**. The purposes of this study were to document the linkages, to review current literature in the field, and to develop methods of analyzing and understanding environment-economy relationships. While the main focus was on these relationships, the study emphasized the need to encourage greater understanding and awareness of the intimate relationship between economic performance, environmental quality, and the quality of human society. One comment in the report is particularly relevant in this context: "...the durability of our society may well depend on the degree to which we apply a conservation or environmental ethic to the economic system."

For the purposes of the present review reference must also be made to the results of a Council workshop held in April 1985. The report of that workshop included a section on **Perceptions of the Environment**, with four perceptions illustrated diagrammatically:

1. The traditional view of unrelated social and economic spheres of activity, which excludes any conscious consideration of the environment.

2. Recognition of environmental factors as a fringe consideration, i.e. a consideration marginal to social and economic aspects of human activity.

3. Recognition that there are areas of interplay between the three spheres (environmental, social and economic).

4. The perception - now gradually gaining acceptance - of the environment as the support system for, and an integral part of, social and economic activity.

The Council welcomed the establishment of the World Commission on Environment and Development (WCED), and viewed it as a major step towards reorienting economic-social-environmental perspectives - and action - on a global basis. Members of the Council met with its representatives and participated in the public hearings which the Commission held during the preparation of its Report.

The present study is to be seen as a background document to support discussion of the Commission's Report at the General Assembly of the United Nations in October 1987. In general, Council is very strongly in support of the WCED's findings and recommendations, and urges the Government of Canada to treat their implementation as a high priority. As is stated below, Council regards the Report as an important advance towards bridging the economy-ecology gulf at the highest international levels. The Council's main reservations concern the relative emphasis given to **environment** and **development**. This may well stem from differences in perception. The four perceptions of the environment summarized above have their origins in the past, but all are to some extent current today. It appears that some members of the Commission may not have shared Council's perception of the environment "as the support system for, and an integral part of, social and economic activity."

## INTRODUCTION

**Our Common Future**, the report of the World Commission on Environment and Development (WCED), is another step in the gradual advance towards a better and more comprehensive understanding of the inter-relationships between the global ecological system and existing patterns of economic growth. These patterns are threatening the sustainability of the planetary environment. By way of illustrating the unintended damage which they inflict on the ecological system, reference is made to the increased greenhouse effect, acid rain, and exposure to UV-radiation by ozone-layer depletion, as well as worldwide depreciation of forests, fisheries, and agricultural soils. Consideration of the Report by the United Nations provides an opportunity to focus world attention on the fundamental environmental concepts and principles that provide the essential context for all human social and economic activity.

The Commission's principal recommendation, that there should be a global effort to achieve **sustainable development**, is viewed by the Council as an important stimulus to the promotion of more refined and effective environmental protection measures and management procedures in Canada. The opportunity it presents should not be wasted. There now seems to be general agreement that the integration of economic aspirations with global ecological imperatives must be accomplished even though there are those who were formerly unwilling to recognize this necessity and who still hesitate to give it practical effect. The success of efforts to sustain economic and social development ultimately depend on the life and health of the ecosystem.

Part I of this commentary reviews basic concepts associated with environment and development, with particular emphasis on **sustainability**. Parts II, III and IV offer an examination of three primary requirements which must be pursued simultaneously if Canada is to progress towards sustainable development domestically and to contribute to the same end in the international sphere. These requirements are:

- a data base, that is, information about and analysis of environmental processes;

- an institutional framework in which decision-making processes affecting the environment include the assignment of responsibility to the decision-makers and means of holding them accountable;

- public awareness of the ecological principles which underlie human activity on the planet.

Concluding comments in Part V are directed toward probable objections to Canadian initiatives in support of sustainable development, for while there are, in our judgement, compelling reasons for a global effort to achieve **sustainable development** the WCED proposal has not found universal approval. Indeed, the government of the United States declined to endorse the WCED proposals at a recent ministerial level meeting in Nairobi on the grounds that they failed to acknowledge the primary role of market forces in any programme of response to environmental or resource

concerns. Canadian policy-makers have generally acknowledged that market forces have not protected the environment.

There is an additional reason for examining the WCED recommendations from a specifically Canadian standpoint. Many of them apply primarily to resource depletion and population problems of developing nations rather than to industrial pollution in the industrialized world.

## PART I. ENVIRONMENT AND DEVELOPMENT: BASIC CONCEPTS

**Sustainable development** is the fundamental goal or objective proposed by the WCED for decision-makers around the world (see Annex 1). The origins of the phrase and its implications are therefore worth a moment of attention.

For much of the past quarter century - particularly since the Stockholm Conference on the Human Environment in 1972 - the relationship between the natural environment and economic development has been the subject of widespread and often intense debate. In the international context controversy has previously centred on the linkage between the urgent requirements of developing nations for income and employment opportunities to support burgeoning populations - regardless of the depletion of natural resource capital - and the growing awareness within industrialized nations of the extent of environmental deterioration which has so frequently accompanied resource development and industrial growth. These themes have played a role in a succession of international projects and proposals including the Stockholm Conference, the New International Economic Order, the United Nations Conferences on the Law of the Sea, the World Conservation Strategy, and the work of the Brandt Commission on International Development Issues.

Canada's economy resembles in part the resource-based economies of developing nations and in part the manufacturing economies of the industrialized world; but in this country the debate between environment and development has typically focussed on the costs of environmental protection measures. Environmental review procedures and compliance requirements have often been perceived as unreasonable fetters on the processes of economic growth. The achievement of sustainable development has been looked upon as an economic problem, to be solved by economic analysis and policy, while environmental protection has been regarded as a relatively unimportant "add-on". Consequently, the preoccupation of environmentally concerned Canadians has been with legislation and regulations designed to curb the worst excesses of pollution and resource deterioration. As a means of dealing with fundamental environmental problems the usefulness of much of this regulatory and legislative effort has been limited. The principal shortcoming has been a lack of appreciation of the underlying ecological principles that govern the relations between humanity and the ecosphere.

The controversies between the champions of the economy and the advocates of ecology reflect a persistent rift between them, maintained by apt and vigorous caricatures of each other. Industrial leaders were depicted by some environmentalists as shameless despoilers of nature, while environmentalists - especially those who in any way supported the conserver society or limits to growth - were characterized as "luddites" or minor variants on stone-age man.

These attitudes, inherited from the time of the first conflicts concerning environment and development, formed part of the context within which the WCED set about its task. Not unnaturally, the Commission adopted as a major objective the transformation of unproductive debate into an effort to advance general understanding by using the results of scientific progress, and by referring to new information and changing perceptions of the environment/ development relationship in certain areas of the industrialized and developing worlds.

**Our Common Future** represents an important advance towards bridging the economy/ecology gulf at the highest international levels. The report brings once more to the forefront a set of issues which had been displaced from centre stage in recent years, even though they were becoming increasingly significant for the future of human well-being and environmental integrity. CEAC fully acknowledges this. At the same time, while it has no intention of weakening the report's impact and indeed desires to strengthen it, the Council differs with the Commission on several questions of emphasis and priority.

(1) Our preference is to use the environment (rather than development) as the focus, and to link development to environmental protection instead of relating environmental considerations to sustainable development.

(2) We would stress more clearly, in addition to the environmental dilemmas of developing countries, the domestic policy and institutional challenges which industrialized nations will encounter on the path towards sustainable development.

(3) Some important concepts and policy directions remain obscure. There is a real risk that positive elements of the WCED proposals will be lost as governments and industries come "on side" and adopt an appealing slogan whose implications have not been thoroughly explored. Thoughtful analysis of **sustainable development** and of the concepts surrounding it should be a high priority task within agencies working out a response to the WCED message. The following pages offer some preliminary reflections on certain critical terms.

## Environment

The current use of the word "environment" implies a certain perception of the globe by its human inhabitants: preoccupied as they are with a multitude of social and economic concerns they have difficulty in perceiving the planetary environment or ecosphere as the pre-condition of their existence. As human beings we tend to base our appreciation and understanding of the environment upon an assessment of the component parts - air, water, soils, forests and so on. We therefore fail to recognize that a fundamental aspect of the environment and its processes is the fact that they function as an integrated whole, as an ecosystem which must be perceived as both living and dynamic. We depend as much upon the processes of the natural world as upon its products. Indeed, available evidence now suggests that these biological processes are not merely dependent on the habitability of Earth. They actually contribute to that habitability.

Resources as components of environment have usually been considered as mere raw materials which require human intervention in the form of "improvement" or manufacture if they are to serve the ends of man. But if environment is understood as ecosystem, the natural function performed by "resources" in global life-support processes can be more clearly seen. This ecological view of the dynamic linkages between elements of the natural world enables us to understand that "improvements" - more correctly regarded as alterations - regularly involve negative trade-offs, losses or costs, no matter how difficult it may be to quantify, or merely to assess, these aspects.

Moreover, it is useful to distinguish between renewable and non-renewable resources.

The only renewable resources, in the strict sense of the term, are natural organisms, or benign products resulting from the continuing activity or decay of those organisms. Through genetic replication these organic materials can increase in quantity. All other resources are non-renewable. Once transformed by human intervention they cannot be reproduced, and the by-products of their use, in the form of waste heat and material residues, frequently remain to pollute and degrade the environment.

The term "renewable" could be appropriately applied to the actual processes of the environment, provided that the environment itself is not being subjected to pressures which undermine its natural resilience. This condition is imposed by one of the major differences between natural and economic systems: within the latter the economic principle of substitution applies to the production and consumption of goods and services, but the former do not permit the application of such a principle. When the processes of an ecosystem cease to operate, it is not possible to invent a new system to replace it, and it will not become possible to do so at any future time. This then is the real source of public anxiety, and official and scientific concern, regarding the misuse of the world's resources: certain global processes may suffer irreversible change.

## Technology

Exploitation of the natural environment is facilitated by technology, that combination of tools and knowledge which permits manipulation and transformation of resources to serve human ends. The apparent "success" of past efforts to extract certain renewable and non-renewable resources at increasing rates and with greater apparent efficiency has contributed to a serious overestimation of our technological capabilities. This has re-inforced in some cultures an unfounded belief in man's dominion over nature. If, however, environmental systems and ecological processes were properly appreciated and understood, it would be readily seen that human control of the environment is not a realizable goal; nor, if we acknowledged man's place in the system, would such control be regarded as desirable. However much technological ability to satisfy man's needs can be expanded, it will not reach the point where it can sustain life independently of the natural processes of the ecosphere.

## Needs

The concept of needs is essential to the understanding of sustainable development and the immediate global challenge of satisfying such fundamental requirements of the world's poor as food, shelter, sanitation and medical care. Apart from certain basic biological requisites which tend to vary in accordance with regional climatic features around the globe, technology and social organization are the factors most strongly influencing the transformation of aspirations into needs. As the WCED explains, "perceived needs are socially and culturally determined". In our own time, there are no obvious psychological or economic restraints moderating the escalation of aspirations in industrialized societies. The WCED has therefore posed a formidable problem in stating that "sustainable development requires the

promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire" (See Annex 1). If such an objective does not call for serious reflection on limits to wants, it at least requires a concerted effort to use, and re-use, effectively whatever resources we must consume.

**Sustainability**

A fundamental component of the concept of sustainability is the preservation of the productive structure or regenerative capacity of renewable resources. The level at which the productive capacity of a resource, for example, a forest can be maintained must be calculated in terms of the dynamic state of the environment, with close attention being given to such issues as resource quality, the extent of the territory to be managed on a sustainable basis, and the choice of time horizon. Consumption and utilization must be co-ordinated with, or disciplined by, the application of these considerations (Baskerville and Regier).

If - as has so often happened in the past - excessive use of renewable resources undermines their productive capacity, sustainability may still be achieved later, but at a lower level. A diminished renewable resource can be redeveloped, provided that the necessary support for such redevelopment, in the form of clean air and water and fertile soils, has not also been diminished. The latter form of loss may, however, occur as a result of severe global imbalances caused by over-exploitation of renewables or by degradation and contamination due to the extent or manner in which non-renewable resources have been used.

CEAC's reservations about the WCED's approach to sustainable development (as summarized in Annex 1) centre on the emphasis chosen by the Commission in its attempt to reconcile environmental integrity with economic growth. This emphasis, in our judgment, appears to be tolerant of development rather than protective of the environment, and is understandably based on the conviction that it is against human decency to keep the desperate poor of the world in poverty in order to protect the environment. Yet conflicts resulting from the deterioration or collapse of ecosystems are emerging on the global stage, an inescapable consequence of the failure to recognize clearly, and to accept as an ordering principle for social existence, that the natural environment, the ultimate supporter of all human activity including development, imposes its own constraints on development in ways which cannot be ignored. Deferral of the immediate application of this lesson to the economic policies of prosperous industrialized states cannot be easily defended.

Acceptance of the concept of sustainable development will not eliminate intense debate between those primarily concerned to achieve economic growth and those whose ultimate priorities are related to the long-term capacity of the ecosphere to nurture life. But the concept of sustainable development has the potential to direct the debate into productive channels through which policy-makers can achieve advances in environmental security while cooperating with the efforts of responsible economic factions to pursue material satisfactions.

Information, institutional change and supportive public attitudes are the three requirements for progress towards sustainable development in Canada. These mutually reinforcing conditions should be designated as goals to be pursued simultaneously by policy-makers concerned to place effective environmental management and economic development on a secure long-term foundation.

## PART II. INFORMATION AND ANALYSIS: THE FOUNDATIONS OF ENVIRONMENTAL POLICY

Sustainable development will not easily be achieved. The WCED has suggested some initial steps, yet, as the Commission itself acknowledges, "there is no substitute for the journey itself, and there is no alternative to the process by which we retain a capacity to respond to the experience it provides." If experience is to elicit an appropriate response, it must be reliably understood and interpreted. Information and analysis are therefore an essential source of continuing guidance along the path to sustainable development. And, since policy development will depend upon an appreciation of natural processes and human interaction with environmental systems, these must be researched both in the natural and in the social sphere. At the risk of over-simplification, we can identify a series of overlapping stages: basic scientific research and data accumulation, accompanied by consideration of human interaction with the environment; formulation of environmental management strategies; and the integration of these with the economic goals and policy processes of government.

Precise scientific understanding of ecological processes is the indispensable condition for developing a capacity to protect the environment by anticipating the likely impact or consequences of particular human interventions. This is true whether we are dealing with a massively disruptive intervention such as the damming or diversion of a major river, or with the cumulative impact of the daily use of common household substances. If we are to achieve sustainable development, we must use the building blocks provided by scientific understanding to construct effective policies through which the goal of economic growth within the natural limits of the ecosphere may be realized.

Scientists from many disciplines have been making contributions to a greater knowledge of the workings of the ecosphere. Their work increasingly directs our attention to the importance of connections and inter-relationships between disciplines. This trend is evident in the new and sudden emphasis on bio -, bio-geo- and bio-geo-chemical research, and on the implications of such research for the human species. It has been accompanied by the adoption of a global approach to environmental scientific enquiry, in which international communication and collaboration play an important role.

Despite these developments, those who have pursued or who have sought to encourage environmentally-oriented scientific research have faced severe institutional difficulties, related to the way in which granting agencies are organized. Because environmental inquiry involves inter-disciplinary work, it has often fallen outside conventional processes of academic review and funding which are closely linked to the traditional disciplines. Moreover, environmental research has - until very recent times - appeared to lack the glamour, or public attention, associated with research into nuclear energy or space exploration. Such a phenomenon as wetlands, for example, was far more likely to have been perceived as an obstacle to suburban expansion than as a distinctive contributor to the functioning of the Earth which, for that reason, needed to be understood. Governments themselves have been reluctant to initiate environmental research programmes. In some cases they have been pressured into taking such action in the wake of calamitous occurrences. Government organization has also been an obstacle, for departments responsible for energy, agriculture or forestry typically have priorities more related to increasing

production in their respective sectors than to maintaining resources over the long term. General pressure to divert effort from basic science to the development of immediately applicable technology, which can be marketed by enterprising corporations, is another factor which has worked to the detriment of many important aspects of environmental research.

It is not easy to present and classify scientific advances under headings which match current popular interest. Nevertheless CEAC would urge that Canada's response to the WCED should insist on a greater effort to find opportunities for stimulating scientific inquiry centered on ecological systems, their carrying capacities, resilience, and vulnerability to stress. One approach would be to encourage the use of strategic grants from the federal research councils (NSERCC and SSHRCC) for domestic and international environmental research. Environment Canada could also contribute directly by undertaking research on sustainability, and indirectly by supporting similar research elsewhere with strategic grants of its own. In this way the department could help to foster an appreciation for environmentally-supportive science. The Canadian Wildlife Service has a related contribution to make through its programmes at the national level, and the interpretation and communication programmes of Parks Canada could, in the longer run, help to broaden public awareness.

One area where notable progress has been made, in Canada and several other jurisdictions, is the collection and collation of environmental data and information, particularly in the form of reports on the state of the environment (Environment Canada 1986; Statistics Canada 1986). Such reporting has a contribution to make to the evidence which can be used to promote support for sustainable development; it necessarily includes interpretation and evaluation of trends and patterns in human use of the environment. The "stakeholder group" on environmental reporting recently published the following conclusions with which we largely concur:

> "The most significant shortcomings stem from the fact that there is no overall coordination of the collection of data on environmental quality and natural resources. Information is collected by federal, provincial, and other agencies to meet their specific interests or mandates. Consequently there are data gaps, and existing data are not always reliable or accessible. There are insufficient environmental and resource data available to allow important risk analysis and epidemiological studies to be carried out, or to create a public understanding of the effects of human activities on the environment" (Environment Canada, 1987).

Environmental analysis depends not only upon scientific research but also upon an understanding of human interaction with the environment. Natural science and social science must therefore advance on parallel tracks. Several difficulties encountered in social science research on the environment have recently been examined under the auspices of the International Federation of Institutes for Advanced Science (IFIAS), which organized earlier this year a meeting on human response to global change. Conference organizers noted, among other limitations, the fact that "those dedicated to the elucidation of human activities have little of the institutional coherence of the international science community." It is vital nonethe-

less to use the tools of social science to make objective assessments of our historic patterns of resource use and environmental management. In this way we obtain generalized insights into the shortcomings and successes on the record, which will have application to sustainable development in our own domestic context, and may prove useful to other countries.

Certain aspects of resource practices in Canada are undoubtedly peculiar to our country, but there is a possible way of making our experience usable for international purposes, and it might form one aspect of Canada's response to the WCED. CEAC believes that, as a country which combines a natural resource-based economy with a significant degree of industrialization, Canada offers a wide spectrum of development experience, from which other countries may draw lessons of general application. Efforts should be made to analyze our learning experience in the areas of environmental planning and management, in an objective and disciplined way, taking account of both the failures and the successes. It would be worthwhile to determine which tasks in environmental management and resource development have been effectively accomplished, and which aspects are still unsatisfactory. The study of failures as well as successes not only serves to show how far specific practices are useful; it can also increase understanding of the overall processes of adaptation to changed circumstances or to the failings in past strategies which have subsequently become apparent.

The focus of a Canadian research programme should be on broad areas or themes of environmental management rather than on specific and localized case studies. Examples of likely subjects for investigation might include:

- non-sustainable vs. sustainable forestry practices, including the effects of capital investment and impact in the socio-economic sphere;

- attempts to solve socio-economic problems and regional disparities by means of excessive investment in technology and retention of participants in certain sections, which results in the over-exploitation of a finite resource, such as the East Coast inshore fishery;

- the destruction of the fertility and long-term productive capacity of Canadian agricultural soils in response to short-term market pressures;

- regulatory regimes which are dependent on inadequate or outdated information, or which restrict their time horizons and so ignore or underestimate the impact of persistent pollutants subject to bio-accumulation or bio-magnification.

These and other themes for inquiry could be used to integrate economic and environmental analysis of Canadian experience in such a way as to illuminate problems which are endemic throughout the world, and notably the developing world.

The progressively developing research base whose growth we hope to foster would be the foundation for the complex task of environmental management. The concept of environmental management encompasses many facets of resource use and environmental protection, several of which are themselves highly specialized areas of activity. Regulation, impact assessment and project modification, technological

innovation, compliance and enforcement monitoring, environmental audits, waste management and re-cycling programmes can all be appropriately regarded as aspects of management, and each activity needs to be integrated with the others as the goal of sustainable development is pursued.

To take impact assessment as an example - and here we refer to the tasks of identifying and evaluating the probable consequences of alternative proposals for development - several features must be considered. The available methodology is in itself a major problem, for environmental modelling is vulnerable to the weaknesses of its own assumptions, as are so many models or projections. Clearly, specialists dedicated to impact assessment are needed, if advances in reliability and credibility are to be made in this area where judgment and interpretation are elements of such critical importance.

Assuming that impact assessment, seen in strictly environmental terms, can advance sufficiently for us to use it with increasing confidence, it must serve as a basis for realistic project modifications and suitable compliance and enforcement mechanisms. It will also be necessary to transfer the cumulative results of the assessment experience into the mainstream of the policy-making process.

Previous studies prepared for CEAC, and the background paper by David Brooks on responses to the WCED report, are among the commentaries which have identified the limitations of traditional economic analysis as it applies to environmental systems. In the study made by Envirocon under the title **Examining Environment-Economy Linkages** it is concluded: "The traditional neoclassical economic theoretical framework, based upon individual preferences and utility, market dynamics and income flow, etc., is not sufficient to understand the interactions and interdependencies between particular economic systems and environmental systems." Brooks lists several specific limitations of cost-benefit analyses:

- many things cannot be satisfactorily measured well;
- many things cannot be measured at all;
- all of the options involve value judgments about the distribution of the benefits and the costs;
- whatever the virtues of "efficiency" as a goal, it is never the only goal, yet it is the only one of which the methods at hand take full account.

However valid the assertion may be that economists have failed to measure or monetize environmental costs satisfactorily, it must be said, on the other hand, that environmental analysts have not tried hard enough to meet the challenge of communicating the true nature of their concerns to officials responsible for the policy-making processes of government. They have certainly not done so in a manner which is consistent with current policy review procedures. Both groups might usefully spend time on improving their tools and techniques of presentation.

We are at a relatively early stage of a process of rethinking environment-economy linkages, directed towards the construction of a widely applicable theoretical or conceptual synthesis (Friend). The effort towards integration at this level must

be encouraged, as the WCED has said; its importance cannot be underestimated. In the meantime, however, there are certain areas where progress may be made by a judicious application of economic considerations to environmental and resource-use issues. Firstly, Brooks observes that the demand side of resource use is at least as worthy of study as the supply side and argues that a perspective based on the demand side is essential if "anticipate and prevent" strategies are to have any chance of replacing current "react and cure" responses. The demand side analysis required is not the conventional market survey carried out with a view to satisfying existing responses. It substitutes for this a comprehensive synthesis of resource-demand processes, with a view to modifying consumption requirements in such a way that fewer resource inputs are needed to achieve equivalent results. Low-resource-use options which Brooks believes now merit further attention include:

- improvements in end-use efficiency so that fewer inputs are needed to achieve the same output (e.g. insulation, low-flow toilets, high-efficiency motors);

- better linkages in production/consumption systems so that outputs become inputs or one input serves a combination of outputs (recycling, cogeneration); and

- actual reductions in the demand function so that fewer outputs are needed or the kind of outputs demanded require fewer inputs (low meat diets, improved public transportation, organic agriculture).

Secondly, there has not yet been in Canada a full review or utilization of a growing literature on economic instruments available for the purpose of furthering environmental aims (Dewees). Some of these instruments, such as the use of effluent rights or emission charges, have limitations which Brooks describes, but they offer opportunities for experimentation which will lead to greater understanding of their operation and potential. Perhaps we might eventually see a new profession of "environmental accountancy" evolving, which could use the tools of economic and environmental analysis to monitor both public and private sector operations and thereby identify trends in their environmental profit-and-loss performance. It should be noted that this conception is not the same as that of an "environmental audit", currently employed by various businesses to assess compliance with existing regulations and to examine products and processes for the degree of environmental hazard they present.

## PART III. INSTITUTIONAL RESPONSIBILITIES AND ENVIRONMENTAL ACCOUNTABILITY

### (a) Introduction

An institutional framework capable of maintaining sustainable development as a long-term objective for Canadian public policy is likely to have extensive repercussions on the structure and organization of government. The concept of sustainable development has implications for federal and provincial government departments and for inter-governmental relations, for local governments, and for the exercise of ministerial responsibility in accordance with the parliamentary tradition. Furthermore, the WCED itself has called upon governments to formulate a "foreign policy for the environment" (See Annex 2), and Maurice Strong, the Canadian member of the Commission, has argued that "the biggest single challenge facing the world community today is to establish effective mechanisms for governance, or management, at the international level with workable linkages to the other levels of governance, from national to local" (Strong).

Government institutions are very closely inter-related. Moreover, policy responsibilities ostensibly conferred on certain agencies are closely linked to- though infrequently integrated with - the activity of other institutions. This is true both domestically and internationally and is well illustrated in the policy fields reviewed by Schrecker in his paper for CEAC. It is also evident that major industries and financial institutions can significantly affect broad patterns of economic activity, and their potential influence carries with it environmental implications.

In Chapter XII of **Our Common Future**, the WCED sets out what it describes as "conceptual guidelines for institutions at the national level" (See Annex 2), and also offers a number of recommendations for international action (See Annex 3). The Commission's observations constitute an outline of the challenges ahead and cannot be seen as a kind of user's manual for a sustainable-development software package which would be compatible with governments around the world. Nevertheless, by focussing on two fundamental institutional goals - responsibility and accountability- we believe that it is possible to identify some possible directions for promising changes compatible with the Canadian political system.

It is argued in the WCED report, and it has been recommended by other commentators, that departments and agencies of government, as well as major private sector organizations, must fully integrate environmental protection and sustainable development into their mandates. They would become, in the words of the WCED, "responsible and accountable for ensuring that their policies, programmes, and budgets encourage and support activities that are economically and ecologically sustainable both in the short and longer terms" (See Annex 2). Incorporation of responsibility for environmental management into the mandates of all agencies of government, including those departments whose responsibilities are centered on economic development, has several attractive features. In particular, it can, within the perspective of the department or agency in question, make it easier to recognize that cost savings may be realized by adopting measures which anticipate environmental problems, instead of merely reacting to them.

The second institutional goal is accountability for the environmental consequences of policy - a somewhat more troublesome concept to which we will shortly return.

(b) **Functions of Environment Canada in a Federal Network of Environmentally-Responsible Institutions**

Since the time of the Stockholm Conference on the Human Environment, departments of the environment have been created by many governments. Some countries however remain without such ministries, and in their case the proposal to incorporate environmental matters into the mandates of existing government departments represents a comparatively quick and convenient way of focussing institutional care and attention on environmental issues. But the WCED's proposal for incorporating environmental analysis into the work of other departments is hardly to be regarded as a demand that existing departments of the environment (DOEs) should be progressively dismembered as a network of environmentally-responsible departments evolves.

If economic development ministries are eventually to assume increased responsibility for the environmental aspects of their policies, quite significant changes will be required in their internal operations. The goal is in itself desirable but no one would seriously expect a sudden and conclusive transformation of economic development ministries into paragons of environmental sensitivity. It is therefore still appropriate to inquire what functions and responsibilities will remain for agencies with specific environmental mandates. If we may assume that the diffusion of responsibility for environmental concerns throughout the system will be a protracted process, we should reflect on ways of formulating a coherent role and developing a sense of cohesion and purpose for a department of the environment operating in a context of progressively decentralized environmental responsibility.

In his background paper for CEAC, David Brooks has identified for discussion purposes several broadly defined roles which DOEs might assume:

(1) They might possess line responsibilities or carry out operational duties related to the environmental aspects of actions performed by other agencies and departments of government. (It is this function, apparently, which the WCED would expect to see eliminated or diminished by the assignment of project-related environmental responsibilities to the bodies initiating the projects.)

(2) On the other hand, DOEs could become policy secretariats or co-ordinating agencies whose efforts would be devoted to influencing the actions of operating departments in relation to environmental matters.

(3) Alternatively, DOEs might act in a service or advisory capacity, somewhat analogous to the assistance which the federal Department of Justice now provides by supplying personnel and providing legislative supervision. They would recruit personnel and monitor environmental policy wherever it originates in government.

(4) Finally, even though there exists a hope that all interests will co-operate with enthusiasm in the pursuit of sustainable development, there will be a continuing role for the environmental equivalent of "the men in blue" to encourage prompt and effective compliance with regulations and environmental guidelines as they evolve.

It is our conclusion at this stage that some combination of the foregoing capabilities will be needed in Environment Canada during the shift towards policies supporting sustainable development. An outline of more specific functions for which a DOE will have responsibility follows:

(i) The responsibilities of a department such as Environment Canada will derive from the continuing need for an agency within government whose primary task is the formulation of an integrated and comprehensive approach to standards of environmental management. Over and above day-to-day and project-oriented requirements there will be a need within the government of Canada for a group dedicated to the purpose of developing a long-term perspective on sustainable development. In this connection a distinction might be made between the task of developing standards, which would devolve on a DOE, and the application of current standards in specific circumstances, which would be undertaken by other departments and agencies as their capability evolved.

Closely related to the function defined above is that of policy co-ordination, that is the effort to ensure the consistency of environmental policy within the realm of federal jurisdiction. Below are listed some of the principal areas in which continuing co-ordination will be necessary:

- the introduction of sustainable development criteria into regional development programmes;

- the application by CIDA of environmental guidelines to international development assistance;

- the continuing development of environmental standards and procedures by regulatory agencies such as the National Energy Board (NEB);

- the consideration by External Affairs of a Canadian "foreign policy for the environment" (See Annex 2).

CEAC has already pointed out the need for an expanded set of environmental principles which could be used as a guide by trade-negotiating teams during both bilateral and multilateral negotiations (CEAC, 1986).

Once a wide range of agencies has assumed a large part of the responsibility for the environmental consequences of their actions, the Privy Council Office (PCO) will play a co-ordinating role through its review procedures and its responsibility for preparing Cabinet briefing materials. As for Environment Canada, it has a vital contribution to make: it must secure the full, effective disclosure of the environmental implications of proposals to Cabinet, in a manner which facilitates the process of comparative assessment. As has been stated in recommendations submitted from other sources, the importance of environmental considerations in long-term

government planning is such that the Minister of the Environment should become a member of the Priorities and Planning Committee of the Cabinet. This move is fully warranted and it is strongly supported by CEAC.

(ii) As the leading federal government agency concerned with environmental protection, Environment Canada will enter into extensive relations with its provincial counterparts for the purpose of formulating criteria of sustainable development and encouraging their application in areas of shared jurisdiction. This is yet another area in which the department must provide integrated policy analysis (environmental, economic, legal) in a manner consistent with long-term sustainable development objectives.

(iii) Environment Canada will continue to exercise some of its existing operational responsibilities. These include the extension and management of the national parks system, a particularly important task because in this field Canada still lags behind other jurisdictions. In Part II above, we drew attention to the continuing need for scientific information and analysis and improved reporting on the state of the environment. To meet this need the number of well qualified scientific personnel must be increased, as CEAC has previously advised (CEAC, 1987), and measures must be taken to strengthen the capacity to collaborate in joint research programmes with other departments, such as Statistics Canada, Agriculture and Health and Welfare.

(iv) It has been noted in the background paper prepared by David Brooks that the responsibilities of the department will become broader in the future, as it engages in more refined policy analysis designed to strengthen linkages between environmental initiatives and the broader decision-making processes of government. There is immediate need for a group within Environment Canada which would assume responsibility for economic analysis in the manner outlined in Part II above. This group would have the following specific functions:

- collection and assessment of available literature on sustainable development;
- review and assessment of economic literature on environmental regulation and control techniques (in the first stage, reference would be made to the Organization for Economic Cooperation and Development - OECD - and North American sources);
- advice to the department on the formulation, in economic terms, of environmental management plans and impact assessments for presentation to other departments and PCO;
- generally, preparing the economic case for sustainable development in priority areas identified by the department.

(v) Environment Canada will also be expected to assist other departments and agencies with the task of incorporating environmental considerations and sustainable development criteria into their own plans of action. It may be appropriate to work out procedures analogous to existing Treasury Board guidelines on financial accountability. Reference may be made to the service and central review responsibilities of the Department of Justice. In any case Environment Canada's relationships with other departments can be expected to have several dimensions.

Individual departments and agencies will vary in their need for environmental work. Because of the highly specific character of much environmental analysis and assessment, some departments will have only intermittent and irregular requirements for personnel with particular knowledge and expertise. In such cases the best location for the environmental scientists and analysts is within Environment Canada itself. The department might hire professionals much as the Department of Justice hires legal professionals for service throughout government. Individuals would be made available for participation in specific projects or would be seconded as requirements came to be defined.

There will be other departments where the frequent recurrence of similar types of environmental considerations will justify the hiring of permanent professional environmentalists to monitor environmental affairs continuously as part of their regular departmental duties. Possible examples are the concern of Public Works for environmental analysis of building interiors or the work of Transport or Energy on streambed crossings.

(vi) In order to provide comprehensive and expeditious environmental review of proposals originating in the private sector, Environment Canada may become involved in the work of joint boards, or may co-ordinate its assessments with those of other regulatory agencies. The department will also be called upon to participate in the review of government initiatives required by law. CEAC intends to hold further discussions of the Environmental Assessment Review Process (EARP) in the coming months.

## (c) Environmental Accountability and the Canadian Parliamentary System

Having reviewed the new and continuing functions which a department of the environment might be expected to assume as a network of environmentally-responsible institutions develops, we must now consider the implications of such arrangements for accountability and ministerial responsibility - both individual and collective - in the Canadian parliamentary system. The following observations are tentative, and can only be reflections on the nature of the issues which must be addressed if we wish to elaborate a long-term perspective on sustainable development in the context of this country's established political systems.

In its most generalized explanation of the concept of sustainable development, the WCED describes it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (See Annex 1). Two broad categories of human users of global resources are thereby described -those now living and the future generations. The WCED emphasizes the importance of acknowledging and accommodating the requirements of the latter. Rhetorical commitment to this idea or goal is becoming increasingly common. "We hold the earth's resources in trust for our children" is one typical expression of this sentiment. The concept of stewardship, which also appears to be experiencing a revival, has similar connotations. Canada's political tradition is however firmly grounded in notions of representation, and our children (let alone future generations and other species) are notoriously unrepresented.

As Ted Schrecker points out in his paper, the Science Council of Canada examined problems of long-term accountability in its "conserver society" studies some ten years ago. "Unfortunately", the Science Council then concluded, "the future has little economic or political power. It has no votes. The government in power, which is a surrogate for the country itself, must take a longer view. It is the responsibility of the government to ensure that future citizens are provided with options." Sustainable development as envisaged by the WCED requires a clear commitment to the future, a commitment extending over a period longer than those brief historical interludes between the counting of the ballots and the issuance of the next writ. The task therefore is to provide institutional support for long-term policies in a manner which can be reconciled with the general principles of representative and responsible government in Canada.

Since the fulfilment of environmental responsibility to future generations is a long-term undertaking it is hardly surprising that references to trusts and trusteeship have become part of the speech writer's material. Legal systems around the world and international bodies too, have used variants of the trusteeship concept as the basis for institutional arrangements in support of the interests of those who are absent, not yet born, or under some constraint or disability which prevents them from managing certain aspects of their affairs (Hunt).

The trust concept has had a complicated history and its current applications are of such a nature that we do not advocate the comprehensive adoption of trust principles as a response to the challenge of environmental protection in Canada. There are, however, certain characteristics of trust relationships which do appear suitable for incorporation into mechanisms of environmental accountability.

In the introduction to his treatise on **The Law of Trusts in Canada**, D.W.M. Waters cites a well regarded general definition of the trust: "... it is the relationship which arises whenever a person called the trustee is compelled in Equity to hold property, whether real or personal, and whether by legal or equitable title, for the benefit of some persons (of whom he may be one, and who are termed cestuis que trust) or for some object permitted by law, in such a way that the real benefit of the property accrues, not to the trustee, but to the beneficiaries or other objects of the trust." Waters subsequently identifies the fiduciary relationship existing between the trustee and the beneficiary as the most essential characteristic of the trust.

"The fiduciary's obligations have been defined in a number of ways by courts and commentators", Waters states, "but essentially it means the duty to account to another, the person with the right of enjoyment over the property in question, for all that one does with the property in the office of trustee. Nothing may be done which is not directed solely towards the best interests of the trust beneficiary or beneficiaries. The ramifications of this character of the office of trustee are many." If we may, in general terms, regard the global environment or ecosystem, and its capacity to sustain equitable development, as the trust property, with both present and future generations occupying the position of beneficiaries, we must then devise means to ensure that there will be trustees who can be held accountable for the use to which the system is put. We are challenged to invent institutions which will channel the conduct of the trustees in such a way that the duty of achieving sustainable development overrides conflicting concern with present self-interest.

Many of today's beneficiaries have direct electoral leverage which they can use to promote their views and interests with respect to environmental and resource management. Opportunities for public participation in environmental assessment and decision-making are also gradually developing; but the task of safeguarding those interests of the future which do not necessarily appear congruent with present preferences is more formidable. Several possible means of injecting the long-term view into the political process are discussed below.

### (1) The Minister of the Environment

As a representative of the environmental considerations of future generations, the Minister of the Environment enjoys a number of obvious advantages. The Minister has ready access to existing information as well as opportunities to call for and obtain further information as required. As an elected constituency representative, a Minister also enjoys democratic legitimacy and, by virtue of appointment to Cabinet, participates directly in political decision-making at the highest level. Membership on the Priorities and Planning Committee of Cabinet would further extend the Minister's influence.

Even so, the office is subject to a number of severe limitations. The most notable of these is the effect of countervailing pressures on the Minister, who, in accordance with the principle of Cabinet solidarity, shares in the collective responsibility for the policies and priorities of the government of the day. And it is precisely the short-term pressures and electoral imperatives which those who are concerned with sustainable development seek to moderate or overcome.

### (2) An Auditor General for the Environment

Consideration should be given to the idea of appointing an auditor general for the environment. In essentially the same way in which the existing Auditor General now reports upon government spending of public revenues in accordance with principles of accounting, an auditor general for the environment could review the performance of government and its agencies in terms of environmental protection standards and the degree to which the natural resource base of the community is being safeguarded. The new officer would report publicly to Parliament on these matters, and in accordance with Ted Schrecker's suggestion "would attempt to catalyze public opinion with respect to the resource implications of government programs, much as the Auditor General's Department now attempts to do with receiving value for money spent by government." While there have been objections to the manner in which the AG has criticized the judgment of democratically accountable governments (Doern and Sutherland), the AG for the environment, as a representative of future generations, would probably be somewhat less vulnerable to charges of this kind. Instead, this officer would be expected to perform a function which present mechanisms of political accountability do not provide for adequately, namely, that of ensuring that there will be a serious effort to fulfil the trust obligations of this generation of politicians to succeeding generations of Canadians. This is a subtle distinction; it remains to be seen whether it will suffice to overcome the suspicions governments now feel at the mere mention of the words "Auditor General".

### (3) A Parliamentary Committee

In terms of our current conception of responsible government - which has found expression in recent reforms - a parliamentary committee (such as the existing Standing Committee on Environment and Forestry) is perhaps the most attractive option. Nevertheless the use of a parliamentary committee as environmental trustee would suggest reservations derived from other perspectives. One source of concern is the influence of government majorities on the composition of such committees, combined with the scope which committee proceedings allow for partisan activity. Another is the natural discontinuity of the political process. Even if a parliamentary committee could satisfy the requirement of political independence which is an essential part of trusteeship, the non-professional and part-time nature of committee hearings and deliberations would still tend to reduce the weight of the views expressed and the conclusions reached.

### (4) A Citizens' Environmental Coalition

It is quite possible that in the years ahead a national coalition of citizen interests will emerge to represent environmental concerns on a voluntary basis, in much the same way as the Business Council on National Issues acts as advocate for major business interests with respect to selected policy issues. Such an organization could render useful service by raising public and official awareness of environmental matters, but its stature within the community would be subject to several factors which are not entirely predictable. These include stability, breadth of composition, and available resources. It is also uncertain how far such a group would be able to synthesize the particular preferences of a fluctuating membership. The formation of a comprehensive environmental umbrella group would be in many ways desirable; such an organization does not appear, however, to be of the type best suited to act in the same sense as a trustee.

### (5) Environmental Council of Canada

In this paper, Schrecker draws attention to the Macdonald Commission's proposal for an Environmental Council of Canada, a body with independent scientific expertise which would be created specifically for the purpose of providing independent information and advice about hazards demanding high national or regional priority: those, for example, that involve major water systems, significant industrial groups, and the actions of federal and provincial Crown Corporations. Such a body could be used to strengthen mechanisms of environmental accountability; it could assume responsibility for representing long-term environmental interests, by giving advice on long-term considerations and broad trends in environmental management and resource use. It would not, however, have any decision-making responsibilities.

The membership of such a Council, and its reporting relationship to Parliament, Cabinet or a designated minister, would have to be determined in such a way as to ensure its independence. One means of strengthening its neutrality and objectivity, and ensuring that it would have the broad independent judgment required to advance the principles underlying the trusteeship concept, would be to include non-Canadian members. As an indication of its commitment to a long-term and global perspective,

Canada could name to the Council a small number of non-Canadian environmental scientists of international stature and distinction.

(6) **Law**

In particular cases it may be possible to prescribe the performance of fiduciary duties to future generations by means of legislation, including in it specific procedures to ensure enforceability. Our studies suggest that the use of this approach would be limited by the need for very explicit legislative provisions and the probable clash between the goals of the law and other policy objectives and responsibilities. The legislative approach would not, in any case, eliminate the need for a practical standard, or identifiable benchmark, against which it would be possible to measure performance of the general duty to safeguard the environment.

On the basis of this preliminary survey of alternative ways of strengthening long-term accountability for the environment, CEAC concludes that no single device will, by itself, ensure that this objective is attained. The proposed Environmental Council seems promising, but it would have to operate in conjunction with several other voices of conscience in the political system, including the Minister, attentive parliamentarians, and NGOs. What must be stressed, however, is that structural innovations in government will be required to provide accountability, if the widely supported concept of trust obligations to future generations is to influence contemporary conduct (Emond).

## PART IV. PUBLIC ATTITUDES AND ENVIRONMENTAL ISSUES

Public attitudes and underlying community values help to channel political actions and to determine the balance of priorities on the lengthy policy agendas of modern states. Our discussion of institutional changes in the previous section takes this observation for granted, and accepts CEAC's assumption that the multitude of polls and opinion surveys demonstrating widespread public concern about environmental issues are essentially correct. What may be lacking, or at least not fully developed, is a clear sense of the policy directions which would be in closest conformity with current scientific understanding and the levels of anxiety regarding landscape and species preservation, environmental quality, resource depletion, the health implications of environmental deterioration and the consequences of inaction on future generations.

Efforts to provide long-term responses to the public's concern will include enhanced measures to disseminate knowledge of economy-environment linkages throughout the public and private sectors, and demonstration projects involving communities through such means as public information programmes and educational activities in schools and universities.

The goal must be to foster a widely shared environmental ethic which recognizes the primacy of ecological interdependence over short-term market and political forces. Such an outlook will have an important international dimension, for it is recognized that interaction among nations in an interdependent world is an essential element of environmental protection and development. To inculcate such attitudes amounts to the establishment of a new mind-set; the difficulties of the task should not be underestimated. Nevertheless, with a view to identifying a series of concrete measures on which immediate progress could be made, we conclude this section with a short list of suggestions for programmes which in our view will contribute to long-term changes in attitude and perception and also make it possible to take practical initiatives consistent with the sustainable development goal.

(1) To increase public awareness of environmental and sustainable development issues, initiatives such as the following should be encouraged:

- condensed state-of-the-environment (SOE) reports, by regions, made widely available;
- short TV clips from the Canadian Wildlife Service (CWS) and Parks Canada on the subject of sustainable development and landscape change; informative commentaries on issues related to long-term climatic change, to be distributed through the weather service;
- airline headset messages informing travellers of the natural features and man-made changes along their routes, to increase awareness of environmental features and the impact of human intervention;
- ecotour tapes or localized broadcasts describing features along selected sections of the TransCanada Highway;
- interpretation programmes for national parks.

Much excellent material has already been produced by agencies such as the National Film Board (NFB), but the high technical and artistic level of our production has not yet found its counterpart in an effective distribution and marketing system.

(2) To enhance the stature of environmental science, Canada should collaborate with other nations and the United Nations Environment Program (UNEP) in establishing a suitable international award for individual contributions and for valuable research initiatives at the national level. Process and product innovation by industry should also be recognized and acknowledged in appropriate ways.

(3) To further basic understanding of environmental considerations among policy-makers and industrial leaders, steps could be taken to:

- introduce a course for public servants, at the Federal Executive Training Centre at Touraine, on the environmental implications of government programs; materials developed by the proposed economic analysis group at DOE, or publications of the Organization for Economic Cooperation and Development, might be suitable for curriculum purposes; programmes at Touraine might also be used for the purpose of inter-departmental exchanges focussed on environmental initiatives;

- encourage industry-oriented conferences, whether privately or publicly sponsored, for discussion of sustainable development ideas and advances in environmentally sound technology.

(4) To encourage curriculum development at all levels of the education system over the long term:

- Environment Canada might support the development of surveys and data bases reflecting the current state of curriculums in environmental education and research;

- work should also be undertaken to communicate to Canadian educators knowledge of successful and promising programmes elsewhere. Spain, for example, now provides students aged 8 to 16 with parallel instruction in natural and political history, emphasizing the interaction between biological, geological and social/political change.

New worthwhile ventures in this area are well under way. The Canada/Man and the Biosphere Programme (MAB), with financial support from industry and co-operation from the universities, has developed a computerized information system for environmental education and training. An inventory of university- and college-level courses on environment and renewable resources management is also being prepared under the auspices of the MAB National Committee.

(5) To direct political attention to sustainable development issues and to identify avenues of potential progress at the national and international levels a sequence of symposia and meetings might be undertaken:

- 1989 or sooner - a televised two-day national summit on the economy and the environment chaired by the Prime Minister of Canada and bringing together parliamentarians, labour representatives, scientists and NGOs;

- 1991 or sooner - a circumpolar conference on arctic marine, wildlife and environmental management hosted by Canada, at which representatives of northern circumpolar nations (including aboriginal residents) would address regional and trans-boundary issues, as recommended by the WCED, and would relate their discussions to an Arctic Marine Conservation Strategy;

- 1992 - Canadian participation in a global conference on sustainable development, for the purpose of reviewing progress, especially with regard to the extension of legal principles for sustainable development. Prior preparation would also include suppport of the second generation of SOE reports and a commitment to achieve demonstrable progress in selected aspects of resource use. Initiatives such as those listed above might well form the basis for a major programme entitled "A Decade of the Environment", whose purpose would be to achieve significant advances in Canada's adoption and application of sustainable development principles.

## PART V. CONCLUDING OBSERVATIONS

### (a) Global Imperatives and the Domestic Agenda

While Canada should work vigorously to apply the principles of sustainable development to the solution of domestic environmental problems, it should continue its activities in the international sphere, both bilateral and multilateral. Here it must be stated that (supposing Canadian policy-makers, despite their belief that environmental progress has been made and their concern about cost increases in the short term, can be persuaded to hold the door open for new environmental initiatives) a new problem will present itself. To the extent that domestic environmental issues can be distinguished from global dilemmas described by the WCED, what relative weight should be accorded to each category?

It is clear that both domestic and international action are essential elements of an effective response to global environmental threats. In this respect, CEAC's position coincides with the views expressed by the Royal Commission on Economic Union and Development Prospects for Canada in its 1985 report:

> "As a prosperous nation that occupies an extensive portion of the earth's surface, Canada has a major responsibility in many areas of environmental concern. Because the effects of human activity on the global environment are often cumulative and long-term, and because so many causes of environmental damage and degradation operate across national boundaries, this responsibility extends beyond the life of the present generation and beyond the boundaries of our own vast land. The measure of our civilization will be determined in no small part by the extent to which we live up to our responsibility at home and continue to offer assistance and leadership abroad." (RCEUDPC, Report).

Countries such as Canada have had opportunities for a long time to work through international agencies and organizations in order to improve understanding of environmental issues and to encourage more effective responses. Recent discussion in Montreal of a treaty on the protection of the ozone layer is one important example of the ongoing process.

At the time of the Stockholm Conference, however, there was a firm resistance on the part of developing nations to the adoption of environmental protection measures which would restrict economic growth and render more difficult the vital tasks of meeting basic needs and furthering development. It would appear from the conclusions reached by the WCED that a somewhat greater willingness to recognize environmental imperatives now exists in the developing world, although the trade-off between short-term advantage and long-term environmental security is viewed as being harder on countries presently facing desperate economic circumstances.

In Chapter Three, **The Role of the International Economy**, the WCED presents a consolidation of its views on the international economy in relation to sustainable development. While much of this material - including the Commission's call "for industrial countries to resume internationally expansionary policies of growth, trade and investment" (**Our Common Future**, p. 75) is beyond the primary focus of a domestic environmental advisory body such as CEAC, the Commission's conclusion that "a failure to address the interaction between resource depletion and rising poverty will accelerate global ecological deterioration" appears to us to be essentially correct. Despite its generality, the WCED's outline of a reform agenda is worth repeating here:

> "Reforms at an international level are now needed to deal simultaneously with economic and ecological aspects in ways that allow the world economy to stimulate the growth of developing countries while giving greater weight to environmental concerns. Such an agenda requires deep commitment by all countries to the satisfactory working of multilateral institutions, such as multilateral development banks; to the making and observance of international rules in fields such as trade and investment; and to constructive dialogue on the many issues where national interests do not immediately coincide but where negotiation could help to reconcile them."

CIDA, the agency principally responsible for Canadian international development assistance, participated directly in the WCED inquiry and has recently issued a policy statement on environment and development (CIDA, 1987). CIDA's new policy comprises five basic elements:

- the introduction of mandatory procedures for assessing the environmental impact of projects funded by CIDA;
- greater emphasis on projects and programmes which are considered to be environment-enhancing;
- promotion of environmental awareness;
- institution-building and support;
- data collection.

CIDA's initiative is welcome, even though it has to be said that this agency has been considered comparatively slow, among bilateral aid agencies, to make environmental considerations an integral part of its development assistance programmes.

Systematic environmental assessment of Canadian development assistance is a useful additional contribution to the effort to incorporate the country's high degree of concern for the environment into various aspects of its international relations. If Canadian experience and our best environmental and resource management practices become part of co-operative development proposals around the world, we will have made a valuable contribution to environmental management efforts elsewhere.

In the 1980s CIDA's initiative can hardly be called controversial, but it will probably encounter some resistance in Canada because of our historic reliance on "tied aid". The use of such aid in certain sectors may make it necessary to take special steps to limit adverse environmental affects. As Schrecker notes in his background paper, it is absolutely essential to assess not only the nature of environmental impacts but also their distribution, for "it is often the case that environmental problems disproportionately affect not just the poorest countries, but the poorest people in those countries." And, to repeat a fundamentally important observation - if indeed repetition is necessary - CEAC agrees with the WCED that the integration of environmental concerns into development assistance programs "should not reduce aid flows in the aggregate or slow disbursements or represent a new form of aid conditionality."

There are other means which Canada can employ to further progress towards sustainable development in the international context, viz.:

(1) Sharing Canadian experience to the extent that it can be disseminated in the form of usable models (see Part II above);

(2) Regional and bilateral co-operation with regard to shared ecosystems or the safeguarding of migratory species. It may be useful to emphasize circumpolar issues and also to offer Canada's experience with the International Joint Commission as a useful institutional model for others to adapt to their circumstances;

(3) NGO contacts to encourage and support public and professional involvement in environmental and development issues;

(4) Enhanced federal support for participation in international scientific research and information exchange networks, particularly in connection with global programmes to monitor the status of environmental conditions and the trends they display;

(5) Support for UN initiatives, including those set out in **Our Common Future** and the UNEP follow-up;

(6) Further emphasis on the environmental dimensions of Canadian aid and international economic development programmes.

Having reviewed these possibilities we must once again emphasize that Canada's credibility in all the areas named depends on the degree of resolution with which we pursue our efforts at home. The influence of the middle powers on the international community has often depended on particular functional capabilities they have developed within their own jurisdictions. Efforts to advance this country's contribution to sustainable development, through information accumulation and analysis, institutional change and programmes to foster public awareness of environmental concerns, can ultimately enhance Canada's ability to further sustainable development on a global level. With this in mind we now turn to a review of objections which may be raised against a serious Canadian effort to follow up the WCED report with action.

## (b) Have Canadians Done Enough?

In its commentary on **Our Common Future** CEAC directed its attention to questions of information, institutions and public attitudes - the essential ingredients in the recipe for long-term progress towards sustainable development in Canada. But it is in the realm of specific policies that the really substantial changes or results must eventually be seen.

In **Responding to Brundtland** Ted Schrecker surveys several sectoral policy fields - agriculture, forestry, energy, industrial adjustment and support programmes, defence and foreign aid. Having dicussed the integration of economic and environmental considerations into policy development in these areas, he concludes - and CEAC agrees with him - that "acknowledging the importance of ecology-economy linkages should mean re-evaluating economics in terms of ecological criteria, rather than the other way around." Indeed it is essential - and Schrecker too makes this observation - to maintain an outlook on global progress towards sustainable development which is independent enough to allow some skepticism about assertions that economic growth and environmental protection are fully compatible or that no real conflicts exist between these two social objectives. This said, we conclude with a series of remarks on some of the major obstacles to sustainable development and a review of reasons why, despite these obstacles, a significant Canadian effort to achieve sustainable development should be undertaken.

The message of the WCED Report is that the current pattern of industrial development around the globe must change because it is ultimately unsupportable. Conclusive evidence already demonstrates the existence of increasingly unmanageable environmental problems. These appear to be growing in magnitude and complexity and to be approaching thresholds at which they will become irreversible. Moreover, they are often inter-connected in ways which are poorly understood. Governments have responded - to the extent that they have offered any response - with essentially cosmetic remedies directed at the symptoms of environmental deterioration instead of the root causes of the degradation of the ecosphere. The longer we delay a more fundamental response emphasizing prevention rather than reaction, the more drastic will be the solutions required and the greater the potential for social disruption. There is a considerable time-lag between public actions and the start of an environmental recovery process; it is therefore critically important that we act now, so that positive results can be achieved in the next two decades.

Those decision-makers who must handle the Canadian domestic and global environmental agendas in the years to come will face a number of difficult objections. There is likely to be an atmosphere of self-congratulation about recent environmental advances, somewhat similar to the context of the **Limits to Growth** debate over a decade ago, in which the advocates of unrestrained economic growth argued that technological advance and innovation offered a natural solution to any anticipated resource scarcities. In particular, statements about improved air and water quality, and the extension of the national parks system, will be used to support the proposition that Canada has done enough - at least for the moment. Other arguments which will be invoked in opposition to significant environmental initiatives will be the need for fiscal responsibility in an era of restraint, and the anticipated costs of restructuring and adjusting Canadian industry to meet the

conditions of the new era of freer trade with the U.S.A. And despite the fact that both the OECD and the Macdonald Commission have rejected a strictly market-oriented approach to environmental issues, criticisms such as those voiced against the WCED report by the United States at Nairobi are likely to be heard again. It is also possible that the evident willingness of individual Canadians and their local communities to contribute financially to famine relief abroad will be cited as a reason for not expanding programmes of official state-to-state action.

There are other grounds for fearing that industrialized nations will fail to respond adequately to the recommendations of the WCED. They are related to our perception that the WCED report downplays or underestimates environmental problems in the industrialized world. On the one hand, several of the key policy issues selected for detailed attention in **Our Common Future** appear to be primarily concerns of the developing world. Population growth and urbanization will serve as examples. The focus on population size diverts attention from equally important demands on the ecosphere imposed by high levels of per capita energy and resource use in the industrialized world. As for other global problems such as deforestation and species extinction, emphasis is placed on the fact that in the developing world they are matters of emergency, and less attention is accorded to their importance in industrialized societies. Occupational health and safety and similar issues which have come to the forefront in industrialized nations receive only brief treatment in the WCED study. The report's approach to such matters may unintentionally encourage the conclusion that the notion of urgency applies only to environmental issues in developing nations, and indeed that the actual solutions will be found by following the industrial model.

Even those who approve of sustainable development as a desirable long-term goal will express qualifications about the conditions under which it is to be pursued. Such reservations lay down by implication conditions under which principles of sustainable development are to be subordinated to other considerations. The Canadian Council of Resource and Environment Ministers (CCREM) Task Force on Environment and Economy, for example, argues that "ensuring environmentally sound and sustainable economic development requires the technology and wealth that is generated by continued economic growth" and refers to the "unique environment and economy" of each province and territory. The first of these two cited passages stands for the proposition that a clean environment is a good thing as long as it can be financed from growth in future earnings. Such a viewpoint understandably appeals to policy-makers in the developing world. It is less applicable in Canada, where much of the technology and financial resources required to support effective environmental management are already available. With regard to the second passage the significance of unique or different environmental circumstances in various jurisdictions does indeed require careful consideration. The diversity of local environments is undeniable, but differences might all too easily be used by governments to avoid their responsibilities for environmental protection and sustainable development in a global context. Relatively minor environmental differences may be invoked by governments attempting to justify exemptions for certain projects they wish to promote. It follows that, in the context of global environmental problems, we must ensure that the assertion that "my part of the ecosystem works differently than your part" is not used to avoid sharing in the collective responsibility for reform.

There is no "quick fix" for the global ecological dilemmas outlined in the WCED report, or for their domestic causes and ramifications. No short-term commitment of effort or financial allocation can undo or correct processes of environmental change and deterioration which are presently underway. The responses called for by the WCED are long-term in nature. They must continue in spite of economic fluctuations and recalcitrant behaviour on the part of states or industries which are unwilling to act responsibly.

At this point it may be useful to consider whether Canada's record to date gives the country an excuse to rest upon the laurels it has gained, as a reputed leader in the field of environmental management, in order to allow the rest of the world to catch up? The answer is no. Unquestionably, progress has been made, in the last fifteen years, with regard to certain environmental problems in Canada, but the gravity of the environmental challenges remaining (toxic waste, acid rain, climate change, emerging health issues) leads CEAC to believe that past accomplishments should be a source of modest encouragement rather than a cause for satisfaction. Indeed, it is fair to suggest that after initially devoting vigorous effort to institutionalizing environmental monitoring and creating assessment agencies, Canada has failed to sustain momentum. Other nations such as Norway are showing the leadership we have presumed to be our own.

Additional reasons for continued action by Canada in response to environmental problems include the following:

(1) **There is an established basis for future Canadian action which should not be eroded.** Canada, as a result of Stockholm, the Arctic Waters Pollution Prevention Act and initiative and participation in the United Nations Conference on the Law of the Sea is seen internationally as having a certain record of accomplishment in managing its environment. One of its most recent actions was to contribute substantial support to the WCED itself, and it has also made significant contributions to international aid and development, although the record of its concern with the environmental implications of past programmes has been a mixed one.

(2) **Remedial measures, rendered necessary by neglect or disregard of the environment, are ultimately more costly and less likely to be effective than anticipatory actions.** This lesson is amply demonstrated by past experience and illustrated by examples provided in David Brooks' background paper.

(3) **Only long-term status and trend studies suitable for international comparisons can produce reliable foundations for informed decision-making.** Canada is in many respects well-situated to undertake, or to co-operate in, studies of this nature. We should grasp the opportunity to further our understanding of Canada's own environmental health and bio-geo-chemical evolution. Canada (as explained in Part II above) should be able to offer case studies and relevant research findings to other developed and developing nations, and in turn obtain from them insights which are pertinent to our own situation. However, interruptions and discontinuities in research programmes and funding (such as have already been experienced in some areas) can destroy much of the value of past efforts.

Already Canada risks losing its place as a respected participant in global environmental systems research, despite the growing importance of such research for Canadian policy.

(4) **If Canada loses interest in environmental questions it will also lose its ability to encourage other countries to strengthen their own programmes, just at the time when there is growing recognition that the global implications of issues on the environmental agendas of nations throughout the world call for widespread, co-ordinated and determined responses.** And it is in the interest of Canadians to promote the adoption of sound environmental practices all around the globe, because cumulative trans-boundary effects of actions elsewhere in the world have direct impacts on Canada and its inhabitants.

(5) **If environmental standards are raised around the world businesses operating in Canada will be less likely to resist domestic environmental protection measures on the ground that they will undermine the competitive position of Canadian industry by raising costs to levels which are excessive in comparison with those which prevail abroad.** This statement has to be qualified by the consideration that environmental regulations constitute only one of the factors influencing global capital flows, and that in this respect labour costs in the developing world are equally if not more significant. On the other hand it is also possible that leadership in the implementation of environmentally sound production and manufacturing techniques will provide Canadian firms with export markets for procedures and technologies developed here.

(6) **At the Venice summit western leaders demonstrated some willingness to strengthen environmental protection** and their deliberations, together with other reports or policy statements to which we have already made reference, constitute part of the well-established case for ensuring that important aspects of environmental policy are not subjected to the play of market forces.

**The most fundamental consideration, which underlies all the others, is the fact that urgent and pressing problems exist and have thus far received inadequate attention from scientists, policy-makers and resource users.**

The environmental agenda has evolved significantly in fifteen years. The original concern with point-source pollutants producing relatively localized contamination has developed into a preoccupation with global problems of risk management and threats to ecosystems. It can be expected that the agenda will broaden still further to include a more direct interest in matters of human health. Long lead times, of about one generation, are required to complete the cycle of environmental action which begins with the perception of a problem, moves through co-ordinated scientific research, mobilization of the public and initiation of the political process, and concludes with the completion of new legal or regulatory responses. It is therefore vitally necessary to re-affirm, on Canada's national agenda, the significance of environmental issues and the urgent need for action, and to participate fully in a global effort to secure sustainable development.

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ANNEX 1

## SUSTAINABLE DEVELOPMENT

The WCED explained sustainable development as follows:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

"... sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire."

"Meeting essential needs depends in part on achieving full growth potential, and sustainable development clearly requires economic growth in places where such needs are not being met."

"Though the issue is not merely one of population size but of the distribution of resources, sustainable development can only be pursued if demographic developments are in harmony with the changing productive potential of the ecosystem."

"... sustainable development must not endanger the natural systems that support life on Earth: the atmosphere, the waters, the soils, and the living beings."

"Growth has no set limits in terms of population or resource use beyond which lies ecological disaster .... But ultimate limits there are, and sustainability requires that long before these are reached the world must ensure equitable access to the constrained resource and reorient technological efforts to relieve the pressure."

"... most renewable resources are part of a complex and interlinked ecosystem, and maximum sustainable yield must be defined after taking into account system-wide effects of exploitation."

"Sustainable development requires that the rate of depletion of non-renewable resources should foreclose as few future options as possible."

"... sustainable development requires the conservation of plant and animal species."

"Sustainable development requires that the adverse impacts on the quality of air, water, and other natural elements are minimized so as to sustain the ecosystem's overall integrity."

Excerpts from the Report of the World Commission on Environment and Development

ANNEX 2

## WCED GUIDELINES FOR NATIONAL INSTITUTIONS

The following extracts from **Our Common Future** reflect WCED's guidelines for national institutions:

"While these existing environmental protection policies and agencies must be maintained and even strengthened, governments now need to take a much broader view of environmental problems and policies" (p. 311). "Environmental protection and sustainable development must be an integral part of the mandates of all agencies of governments, of international organizations, and of major private-sector institutions. These must be made responsible and accountable for ensuring that their policies, programmes, and budgets encourage and support activities that are economically and ecologically sustainable both in the short and longer terms. They must be given a mandate to pursue their traditional goals in such a way that those goals are reinforced by a steady enhancement of the environmental resource base of their own national community and of the small planet we all share" (p. 312).

"Sustainable development objectives should be incorporated in the terms of reference of those cabinet and legislative committees dealing with national economic policy and planning as well as those dealing with key sectoral and international policies" (p. 314).

"Where resources and data permit, an annual report and an audit on changes in environmental quality and in the stock of the nation's environmental resource assets are needed to complement the traditional annual fiscal budget and economic development plans" (p. 314).

"Governments that have not done so should consider developing a 'foreign policy for the environment'" (p. 314).

"Strengthening of environmental agencies is needed most urgently in developing countries. Those that have not established such agencies should do so as a matter of priority... (p. 319). Industrialized countries also need greatly strengthened environmental protection and resource management agencies. Most face a continuing backlog of pollution problems and a growing range of environment and resource management problems too. In addition, these agencies will be called upon to advise and assist central economic and sectoral agencies as they take up their new responsibilities for sustainable development" (p. 319).

"Governments, individually and collectively, have the principal responsibility to collect this information [on environmental changes] systematically and use it to assess risks, but to date only a few have developed a capacity to do so" (p. 324).

"NGOs should give a high priority to the continuation of their present networking on development co-operation projects and programmes, directed at the improvement of the performance of NGO bilateral and multilateral development programmes... (p. 328). In many countries, governments need to recognize and extend NGO's right to know and have access to information on the environment and natural resources; their right to be consulted and to participate in decision making on activities likely to have a significant effect on their environment; and their right to legal remedies and redress when their health or environment has been or may be seriously affected... (p. 328). International NGOs need substantially increased financial support to expand their special roles and functions on behalf of the world community and in support of national NGOs. In the Commission's view, the increased support that will allow these organizations to expand their services represents an indispensable and cost-effective investment. The Commission recommends that these organizations be accorded high priority by governments, foundations, and other private and public sources of funding" (p. 328).

ANNEX 3

## WCED RECOMMENDATIONS ON INTERNATIONAL INSTITUTIONS

The following extracts from **Our Common Future** reflect WCED's recommendations on international institutions:

"The existing regional and subregional organizations within and outside the UN system need to be strengthened and made responsible and accountable for ensuring that their programmes and budgets encourage and support sustainable development policies and practices" (p. 315).

"A new focus on the sustainable use and management of transboundary ecological zones, systems, and resources is also needed... (p. 316). Governments, directly and through the UN Environmental Programme (UNEP) and the International Union for the Conservation of Nature and Natural Resources (IUCN), should support the development of regional and subregional co-operative arrangements for the protection and sustained use of transboundary ecological systems with joint action programmes to combat common problems such as desertification and acidification" (p. 316).

"All major international bodies and agencies of the UN system should be made responsible and accountable for ensuring that their programmes and budgets encourage and support development policies and practices that are sustainable. Governments, through parallel resolutions in the respective governing bodies, should now begin to reorient and refocus the mandates, programmes and budgets of key agencies to support sustainable development" (p. 317).

"As in each agency, there is also a need for a high-level centre of leadership for the UN system as a whole with the capacity to assess, advise, assist, and report on progress made and needed for sustainable development. That leadership should be provided by the Secretary-General of the United Nations Organization... (p. 318). To help launch and guide the interagency co-ordination and co-operation that will be needed, the UN Secretary-General should constitute under his chairmanship a special UN Board for Sustainable Development" (p. 318).

"... Within such a new system-wide commitment to and priority effort on sustainable development, UNEP should be the principal source of environmental data, assessment, reporting, and related support for environmental management as well as be the principal advocate and agent for change and co-operation on critical environment and resource protection issues" (p. 320).

"The Global Environment Monitoring System should be expanded as rapidly as possible, and the development of the Global Resource Information Database should be accelerated to bridge the gap between environmental assessment and management. Special priority should be accorded to providing support to developing countries to enable them to participate fully in and derive maximum benefit from these programmes" (p. 321).

"Considering the critical importance of renewed efforts on environmental protection and improvement, the Commission appeals to all governments to substantially enlarge the Environment Fund..." (p. 322).

"There is an urgent need to strengthen and focus the capacities of ... bodies to complement and support UNEP's monitoring and assessment functions by providing timely, objective, and authoritative assessments and public reports on critical threats and risks to the world community. To meet this need, we recommend the establishment of a Global Risks Assessment Programme..." (p. 325).

"We recommend that the General Assembly commit itself to preparing a universal Declaration and later a Convention on environmental protection and sustainable development" (p. 333).

"In order to marshal and support investments in conservation projects and national conservation strategies that enhance the resource base for development, serious consideration should be given to the development of a special international banking programme or facility linked to the World Bank. Such a special conservation banking programme or facility could provide loans and facilitate joint financing arrangements for the development and protection of critical habitats and ecosystems, including those of international significance, supplementing efforts by bilateral agencies, multilateral financial institutions and commercial banks" (p. 338).

ANNEX 4

# RE-CREATING ENVIRONMENT CANADA

## Opportunities for Canada to React Positively to the Implications of the World Commission on Environment and Development

A Report to the Canadian Environmental Advisory Council

by

David B. Brooks

14 September 1987

Marbek Resource Consultants
Ottawa, Ontario

**Conservation is a process - to be applied cross-sectorally -**

**not an activity sector in its own right .**

World Conservation Strategy

## PREFACE

The following report was prepared during the latter half of the month of July as one of the inputs being gathered by the Canadian Environmental Advisory Council (CEAC) for its submission to the Minister of the Environment, the Hon. T.M. McMillan, concerning Canada's actions following upon the report of the World Commission on Environment and Development (variously called the WCED or the Brundtland Report after its chairperson, Mme G.H. Brundtland, Prime Minister of Norway). This document was prepared under severe time constraints as a draft report and subsequently revised slightly after the initial draft had been reviewed by members of CEAC.

The subject matter of this report is as large as time constraints were severe. This in itself limited the range of topics that could be considered. How could the range be limited? Several possibilities appeared. Surely there was no need simply to repeat the conclusions of the WCED - for example in urging greater attention to efficiency in resource use, to preservation of gene pools, etc. Earlier documents, including many in Canada, make the same points.

Moreover, parallel reviews of the implications of the Brundtland Report have been requested by CEAC or are under preparation by agencies within the Ministry of the Environment. In particular, a second "outside" study by Ted Schrecker was submitted to CEAC in revised form at approximately the same time as this report was submitted in draft form. This report covers more than adequately most of the resource topics that have, in one form or another, been prominent in Canadian environmental debates since the Science Council's initial reference to a conserver society in 1973. (Indeed, the Council's final report, **Canada as a Conserver Society** (1976), remains a remarkably useful compendium of recommendations and ideas that would go far to realize the results sought by the WCED.) Environment Canada is itself engaged in a number of parallel exercises focussing on environment-economy linkages, including an internal report and a federal-provincial one under the auspices of the Canadian Council of Resource and Environment Ministers (CCREM). Nor is this subject so new a field as some seem to believe, either in Canada (Leiss 1978) or elsewhere (OECD 1984). Taken together, these documents should bring together what needs to be said on the "environment industry" (Slater, 1987) and related topics.

What is left to be brought onto the floor? Mainly, I believe, Environment Canada itself, and its ability to initiate, promote, support, instigate, provoke and stimulate positive responses to the Brundtland Report. Therefore, this report focusses on the institutional abilities of Environment Canada. It can usefully be read in conjunction not only with other documents on the Brundtland Report but also with David Crenna's report to the Corporate Planning Group of DOE. Essentially the objective of the document is to move Environment Canada into a position from which it can strongly urge, if not bring about, the kinds of internal re-evaluation of policy that Madame Brundtland has, as Prime Minister, sought in Norway.

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## INTRODUCTION

There are two polar concepts as to the appropriate role for an environmental group in a central government. At one pole is the notion of a line ministry with formal authority strong enough to allow it to limit or modify the activities of all other agencies; in effect, the group would ensure that environmental concerns come to play the role that budget concerns currently do. At the other pole is the notion of a ministry of state that would have no line authority but would use its ideas and knowledge to try to influence line agencies in favour of greater attention to environmental concerns.

However useful the two poles may be as concepts, neither represents a practical alternative. The concept of overriding ministerial authority for the environment (as envisaged by deep ecologists) falls short on theoretical grounds; environmental implications extend so widely that centralized authority would be tantamount to bureaucratic dictatorship. And the concept of a secretary of state (as envisaged by free market economists) falls short on practical grounds; departments without line authority are simply not taken seriously.

Ironically, recent trends have been leading toward both poles at once. On the one hand, international reports such as that from the WCED, and domestic ones such as that from the Study Team to the Task Force on Program Review (familiarly called Nielsen No. 1, 1985), plus the views of most of the environmental constituency as represented by NGOs, all urge greater authority for central environmental agencies. On the other hand, other domestic reports (as with Nielsen No. 2, 1986) and the tenor of political and business opinion reflected in conservative election victories suggest a lighter hand for government and for environmental authority along with it. A few reports, notably that from the Royal Commission on the Economic Union and Development Prospects for Canada (1985), have found a middle course by arguing in favour of the latter trend in general but stating explicitly that environmental concerns (apparently broadly interpreted) represent an exception to the rule.

If neither pole is appropriate, one must conceive of Environment Canada as a central agency with considerable influence yet with direct power over only a limited range of functions. If anything, the latter concept of less explicit power is likely to reflect the "environment" within which Environment Canada will have to work regardless of the government in power in Ottawa. This report is written from that perspective, with the intention of finding ways for Environment Canada to bring about the micro- and the macro-reforms that are implicit in the conclusions of the Brundtland Report. (That report was moderately clear in its recommendations for change at the international level but remarkably if understandably diffident about making recommendations for national governments.) However, it is equally written from the perspective that, should Environment Canada be able to effect those reforms, the final result for the country would be more like a social and cultural- and possibly even an economic - revolution.

## GETTING THE HOUSE IN ORDER

At the heart of the Brundtland Report is the insistence that environmental concerns cannot be exclusively the domain of a single department but must become incorporated into the operating procedures of all the line agencies. However, all too implicit in the Brundtland conclusions is the need for environmental departments that are:

- **strong**
- **competent**
- **enthusiastic.**

At present, Environment Canada is none of the foregoing. This section will discuss three problems that will, to a significant degree, limit Environment Canada's ability to stimulate a strong response in Canada to the Brundtland Report: lack of economics capability, absence of legal support, and timidity in fulfilling its role as advocate for the environment.

### Economics

Environment Canada prides itself on being a scientific department, and to a considerable extent that is an accurate description. However, policy decisions and budget allocations are not generally made on the basis of biological or chemical evidence, nor is it the Ministry's scientific conclusions that come to be challenged. Government makes its choices on the basis of economic and political evidence - at worst, strictly dependent on power relationships; at best, after careful balancing of benefits and costs.

At present, Environment Canada has little or no ability to participate in those choices where it counts - during inter-departmental meetings, in dealings with the PCO, in Cabinet Committees - because it lacks any in-house economics capability. As a result, the Department enters bureaucratic and political battles on the basis of the need to combine economic and environmental objectives, yet with the ability to put forward its case only half way - and perhaps, given the strength and inclinations of other departments, only the weaker half.

Environment Canada does have economists sprinkled throughout its sections. For the most part they focus on relatively narrow topics of interest to those sections, and only from a micro-economic point of view. What the Department lacks is a body of economists to whom senior management can turn for both micro-and macro-economic analysis and advice. Three examples will illustrate the point.

(1) Energy Minister Marcel Masse has initiated a process called Energy Options to review choices for Canadian energy policy. The focus of the discussions is economics and, perhaps for this reason, Environment Canada appears to be all but ignoring the process - despite the fact that energy supply and demand probably have more to do with the state of our environment than any other single set of forces. At the Calgary meetings opening Energy Options, one seat was allotted to Environment Canada. The individual who attended made no interventions, nor did he seek out the numerous representatives of environmental groups who were in attendance.

(2) Following the Nielsen Study Team's reviews of Environment Canada, the Department created its own intra-departmental task force to determine which recommendations to accept and how to react to them. As a part-time outside participant in that process, it became sadly clear to me that no one at Environment Canada was regularly monitoring and familiar with the vast literature that has been published on economic tools (emission charges, pollution rights, etc.) proposed and to some degree tested as ways to improve the impact of market forces on the environment.

(3) At several points in recent years, Environment Canada has made submissions or prepared documents urging this or that policy. Those documents have begun to allow for the specific micro-economic aspects of environmental policy -ie., the costs of control in comparison with the lack of control. Emphasis is placed on the low overall cost of environmental protection. However, I have yet to see analyses, apart from a few on acid rain strategies for the United States, that incorporate national and, probably more to the point, regional macro-economic considerations: jobs, incomes, development - the economic stuff of which politics is made.

No one maintains that economic theory and its decision-making applications, such as benefit-cost analysis, are purely objective. Unfortunately, most economists, having made that admission, go on to act as if they were. Worse yet, non-economists are typically so overwhelmed by the apparent objectivity of the analysis that they raise no objections. Discount rates, efficiency criteria, inter-generational equity and most other tools in the economist's kit are all at least partially normative. Furthermore, economic theory itself indicates that nonrenewable resources will be extracted too quickly, and that environmental resources will be undervalued, under competitive conditions. Environment Canada desperately needs economists who can argue the case for sustainable development as an **economic** choice.

## Legal Support

As the first Director of Canada's Office of Energy Conservation, one of my most difficult tasks was dealing with the legal staff at Energy, Mines and Resources (EMR). Invariably they found reasons why EMR could not do something we proposed to conserve energy, or at least why it would be legally or constitutionally questionable. More recently, as part of the team evaluating the Energuide program (energy labels on household appliances), I found the same problem at Consumer & Corporate Affairs - to the extent that no store has ever been charged, even though one chain (Brick) openly violates the rules by removing the Energuide labels. The absence of appliance standards is clearly a result of objections from federal lawyers.

(Ironically, the same reason exactly, albeit in reverse, is given by the Province of Ontario's lawyers for staying out of the field.)

Few federal departments have their own legal staff. For the most part, legal staff is provided by the Department of Justice. Lawyers may work for Environment Canada, but they are ultimately responsible to, and receive their advancement from the Ministry of Justice. This approach no doubt offers advantages of various kinds to the government, but it implies the absence of any lawyers committed to Environment Canada, much less to environmental issues. The alternative of hiring legal staff directly for the Department is, if not impossible, at least extremely difficult. Yet, under existing circumstances, it is most unlikely that imaginative approaches will be accepted or even considered for those difficult areas where environmental issues impinge on jurisdictions and mandates that lie outside Environment Canada.

## Environment Canada as Advocate

Environment Canada was established with great hopes, nurtured in part by a young and energetic staff. Those hopes have never been fulfilled, and over time the more imaginative, perhaps even the more combative, staff have left and the rest have gotten older. With notable exceptions, the Department lacks both confidence and enthusiasm for the environmental struggle in which it is engaged. The words of a former Secretary under the Kennedy administration in the United States are apt; he described the bureaucracy he managed as "bowed but unbloody" - and this well describes Environment Canada today.

This lack of confidence and enthusiasm within Environment Canada is made all the more serious by the awkward position in which the Department finds itself. As noted by the Nielsen Study Group (1986; see Appendix), Environment Canada has an informal mandate in terms of expectations by the Canadian people that is as large and important as its formal mandate in the DOE Act. Moreover, the informal mandate can only be fulfilled when the Department takes on the role of advocate, a role that is not only uncomfortable for many bureaucrats but at variance with the role needed in fulfilling its formal mandate.

Restoring the needed enthusiasm to Environment Canada can be achieved only with support from senior levels of the Department. Good work must be rewarded and timidity in promoting the cause of environmental health condemned. Bureaucratic disagreements with other departments should be expected, even welcomed, if they mean that those departments are taking Environment Canada seriously. Moreover, bureaucrats must be encouraged to speak out publicly whenever the evidence justifies, with minimal limitations imposed, perhaps only when they are specifically opposing a stated government policy.

Finally, Environment Canada must take pride in its role as advocate for the environment. The Department need not establish the appropriate balance among various considerations all by itself, any more than it would expect Energy, Mines & Resources Canada to establish the appropriate balance between mining and environment, or Agriculture Canada between farm production and pesticides. Balance will be established by interaction among departments and, ultimately, among ministers. Environment Canada's role is to put forward, as strongly as possible, the case for

the environment - not naively, not irrationally, but also not timidly and, most importantly, not after discounting for what it thinks other departments will accept. An advocate is **supposed** to be biased, and **Environment Canada should be biased in favour of the environment.** Or, stated more cautiously, it should be biased but objective: never using misleading or inaccurate information, but putting environmental objectives above the objectives of other actors on the Federal - on the Canadian!- scene.

## SHARPENING THE TOOLS

### Shifting to Anticipate and Prevent Strategies

The final Brundtland Report, and perhaps even more the interim report, **Mandate for Change** (1985), emphasize the need for governments to shift from "react and cure" strategies to "anticipate and prevent" strategies. This is acknowledged to be more easily said than done. A growing literature indicates the difficulty even of defining such a strategy, much less carrying it out (O'Riordan 1985). Most environmental legislation, for example, is result-oriented, not process-oriented, with the result that it tends to support a "react and cure" strategy and to promote use of older, established technologies. Environmental impact assessment procedures are among the few exceptions.

Given the inherent difficulties, it may be essential to approach the "anticipate and prevent" strategy indirectly. A review of changes in industrial emissions over the past couple of decades suggests strongly that efforts aimed at (a) overall plant modernization and (b) energy and materials conservation have gone further toward reducing emissions than have policies and programs aimed at those emissions directly. Ironically, this means that in Canada and elsewhere we have, almost unbeknownst to ourselves, been sneaking up on an "anticipate and prevent" strategy. For example, the past decade has witnessed a major reduction in the emissions from pulp and paper mills in Canada. However, a large part of that reduction came through process change linked to a federal-provincial modernization program initiated in 1979, not through investment in pollution control. The program paid up to 25 percent of the capital costs of new plant and equipment. While some part of the assistance did go toward the installation of newer pollution control measures - in effect, better end-of-the-pipe solutions - the greater share went for process change which indirectly reduced emissions - in-plant solutions that reduced or promoted re-use of waste. Notably, prior to the program, 22 plants in Quebec were using the sulphite process, which has no more than a 50 percent yield; now, only 13 plants continue to use the sulphite process, while the others switched to the thermo-mechanical process, which yields 92-94 percent of the raw materials. As a result, the Biochemical Oxygen Demand (BOD) requirements of effluents have been greatly reduced.

### Focus on the Demand Function

The Brundtland Report highlights both past and potential gains in energy and materials conservation. The effect of this effort appears in steadily declining energy - and especially materials - intensity in industrial society. All evidence indicates that exactly the same potential to reduce intensity is available for water (Marbek 1987a).

From an environmental point of view, downward shifts in the demand function for resources have the important secondary effect of reducing the need for primary production, and it is primary production that is the source of the greatest share of environmental damage. For example, greater efficiency in the use of energy has all but eliminated the possibility of natural gas production in the Arctic and greatly weakened the case for oil production; greater efficiency in the use of metals (plus more recycling) has reduced the pressure for mining firms to move into wilderness

areas; improved end-use efficiency for water could all but eliminate requirements for new supplies in urban Canada.

The reverse situation - where environmental concerns lead to greater efficiency in use - can also occur, though it is rather less common. For example, pollution control regulations in the U.S. and Canada have induced major industries to become less water-intensive. It is simply cheaper, for example, to re-use or recycle waste water than to treat it sufficiently to make it acceptable as an effluent. Even in this case, the focus of the response is on conservation, not on ways to reduce pollution per se.

Gains in efficiency can create their own problems. For one thing, in some cases the efficiency gain involves its own adverse side effects, as with indoor air quality (though this problem is by no means entirely a result of energy conservation). For another, those regions and economic sectors dependent upon construction activity and primary production will experience slower growth or even decline. For still a third, the gains can involve a shift in not just the quantity but also the quality of resource use. For example, the shift to thermo-mechanical pulping described above implies greater use of electricity relative to other energy inputs in the production process. However, despite such qualifications, from an environmental point of view the overall gain from reductions in demand is unequivocal.

Specific policy options in support of resource conservation are described by Schrecker. The point here is a little different, namely that **the demand side of resource use is at least as worthy of analysis as is the supply side**. It will likely prove more important over the long run to limit the demand for, say, electrical power than to find ways to reduce emissions from thermal generating stations or to oppose nuclear stations. Environment Canada must be prepared to devote more of its resources to analysis of low-resource-use options, including:

- improvements in end-use efficiency so that fewer inputs are needed to achieve the same output (eg., insulation, low-flow toilets, high-efficiency motors);

- better linkages in production/consumption systems so that outputs become inputs or one input serves a combination of outputs (recycling, cogeneration); and

- actual reductions in the demand function so that fewer outputs are needed or the kind of outputs demanded require fewer inputs (low meat diets, improved public transportation, organic agriculture).

Few of these options are as much technical as they are policy and program options, and for the most part they are limited in application not so much by market forces as by institutional barriers. Analysis of these options can go far toward indicating the most effective **and least-cost** ways of attaining environmental objectives. Indeed, it is arguable that the true "anticipate and prevent" strategy must involve approaches from the demand side if it is to prove successful.

## Making Markets Work for the Environment

For the past 30 years or so, a body of literature has been growing about the possibilities for using economic instruments to achieve environmental objectives. A variety of instruments exist and have been surveyed for various jurisdictions (OECD 1980; Schelling 1983); at least one such survey was prepared for Environment Canada (Marchant 1984) and another for the Ontario Ministry of the Environment (Peat, Marwick & Partners 1983). Judicious use of these instruments could assist Environment Canada in its efforts to achieve more sustainable forms of development in Canada, and they happen to fit nicely with current political leanings.

In most, if not all cases, the use of economic instruments depends upon the identification and measurement of a limited number of physical measures (in some cases only a single measure) taken as significant for environmental effect (e.g., chemical oxygen demand, suspended solids, sulphur content, decibel level). They are particularly useful in situations where there is a definable effluent (or group of effluents) that is deleterious but not so highly toxic as, say, arsenic, and that is emitted from numerous point sources. Based on experience to date with such instruments, several general conclusions can be established:

(a) Almost any approach is likely to be more difficult in practice than its proponents recognize. For example, design of an incentive scheme turns out to have higher information requirements and administrative costs than economists predicted.

(b) Nothing in the nature of economic incentives relieves government of the necessity to make difficult decisions and to define trade-offs. Even a theoretically optimal system of emission charges requires choices about "acceptable" levels of damages, about who (or what regions) will receive those damages, about compensation policies, etc.

(c) It is now widely accepted that a mixture of traditional regulations and economic instruments provides more flexibility, is better at stimulating innovation and will likely be more efficient than either alone.

(d) Use of economic instruments has significant implications for the distribution of income among groups in society, among firms, and among regions. In retrospect, it appears that such equity effects, even when not explicitly recognized, have been responsible for limiting the use of economic instruments. One way to cope with this problem has been to link charges and subsidies. As stated by the OECD, "No pure charge policies exist. It has been necessary in order to make charging effective and acceptable to combine in with redistribution of the charge revenue by subsidies to some dischargers" (1984).

(e) All of the economic instruments that provide for charges or fees result in substantial revenues to the government (eg., some hundreds of millions of dollars annually in each of several European countries), even if the charge or fee is at a modest level. Thus, pressure to recycle those funds to additional environmental work or to adversely affected firms or regions is

to be expected. On the other hand, there is no theoretical reason why this recycling is required; subsidies should be considered on their own merits.

(f) No full economic instrument has been developed for non-point sources. Most governments continue to rely upon direct controls (eg., auto emissions), but the use of fees is growing. The fees may simply be a way of charging costs back to the source (eg., sewer fees) or they may be intended to cut back on use (eg., fees on one-way bottles; higher taxes on leaded gasoline).

The concept of emission charges appears to be having greater success with water than with air pollution control (and also, though to lesser degree with noise control). Per contra, the bubble or transferrable rights seems to be enjoying its greatest success with respect to air pollution control. (An exception can be made with regard to $SO_X$, where measurements can be made directly and where a specific link appears to have been made between emittant and damage. Emission charges are being levied in many countries per tonne of sulphur emitted.) The differences lie in the difficulties of measurement, of tracing movement and of making links from emission to result. A further advantage of the bubble approach is that all emissions can be dealt with at once, rather than enumerating specific problem chemicals.

Economic instruments remain controversial as ways of achieving environmental objectives. Kelman (1984) suggests that totally different world views may underlie the different approaches of various proponents: those favouring standards focus on aggregate amounts released to the environment and on improvements across the board (ie. for all populations); those favouring incentives focus on marginal gains with differential reductions depending upon costs and exposure in the aggregate. Thus, ethical differences may inhere in the different strategies with the result that support or opposition to economic instruments can be as much ideological as substantive.

Ironically, just as politicians and regulators are becoming convinced of the value of the economic calculus, economists are becoming more diffident about their benefit-cost, cost-effectiveness and other calculations. Or, to be more precise, they are becoming more diffident about their use as prescriptive tools. What they are realizing more and more is that:

- many things cannot be measured well;
- many things cannot be measured at all (in a meaningful way);
- all of the options involve value judgments about the imposition of the benefits and the costs;
- whatever the virtues of "efficiency" as a goal, it is never the only goal, yet it is the only one fully captured by the methods at hand.

If there is a conclusion that Environment Canada can draw from all this, it would be to look for opportunities to experiment with economic instruments, but to do so cautiously. Everything suggests that approaches that incorporate the virtues of simplicity, predictability and transparency will do better than those that ignore these criteria.

## State of the Environment Reporting

The recent companion volumes from Environment Canada (1986) and Statistics Canada (1986) that represent Canada's first state of the environment report offer a new tool for environmental analysis and advocacy. So much has already been written about them that little new can usefully be added here. Suffice it to say that the process of state of the environment reporting can help establish support for sustainable development, and all the more so if that reporting responds to the requirements of stakeholders (Marbek 1987b).

What may not have been said strongly enough is that state of the environment reports are inherently both scientific and political documents. This combination is unavoidable (indeed, it is desirable) because interpretation must accompany the numbers. Moreover, such reports should go beyond scientific data and include, at least periodically, information on related phenomena, such as economic linkages (the ACS Group 1986) and the state of the environmental movement in Canada.

Current plans for a full state of the environment report in Canada every five years, with interim and specialized reports published during intervening years, make sense. The key problem of the reporting process will be to use the political aspects imaginatively without violating the report's scientific credibility. Possibly this can be accomplished by giving responsibility for the report to a special group, partly isolated from the rest of the department (as with FEARO), but with enough links to ensure that the report is more than a statistical compendium of what used to be. Or, if such a compendium is needed, parallel reports with more "style" should be prepared with the Canadian public as the intended readership.

## PLAYING WITH THE BIG KIDS

Environment Canada does not at present have much clout at senior levels within the Federal Government. There are a limited range of ways to get such clout, and they must be acted upon if the concepts of sustainable development are going to play much of a role in Canada's future. Polling evidence indicates that Canadians feel quite comfortable with these concepts, and that they are willing to make significant trade-offs in achieving them. Anecdotal evidence suggests that many ministers are willing to take environmental concerns seriously even if they do not as yet understand the link to sustainable development. The major gap appears to come not between the people and their political leaders but between those leaders and the government that they nominally lead. The measures discussed below are designed both to win over political leaders and to communicate their wishes forcefully to senior bureaucrats.

### Memoranda to Cabinet

All major policies and programs pass through a stage as Memoranda to Cabinet, when they are reviewed by the Privy Council and by other concerned agencies within the Federal Government for fiscal, economic and political implications. They almost never receive review for environmental implications. This must change, and it must change in such a way as to involve any federal agency proposing policies or programs with significant environmental impacts.

In order to make proposals as comparable as possible and therefore to assist Members of Parliament in the evaluation, the format of the Memorandum to Cabinet is fixed quite closely by formal guidelines. Those guidelines should be adjusted to include a section entitled "Environmental Implications" comparable to other sections for "Federal-Provincial Implications", etc. Obviously, the simple inclusion of such a section would not in itself ensure that departments would react with thoughtful or substantive conclusions. (As Laframboise pointed out in the context of energy conservation, it is part of every young federal manager's education to learn how senior bureaucrats can avoid even explicit directives contained in a Cabinet Directive [1975].) However, a section on environmental implications would at least ensure that Environment Canada is involved in the review of documents at the key Memorandum to Cabinet stage.

In order to avoid excessive demands on other departments, to say nothing of those on Environment Canada itself, it would be well to include in the proposed new section a set of filters to indicate when environmental impacts are and are not to be considered significant - and thus when execution of the new section is not required. As with the environmental assessment procedure, certain types of proposals could receive automatic exemption from completion of this section of the Memorandum-those involving the educational system, for example. (This is not to say that there is not a link between education and environment but only that the Memorandum to Cabinet is not likely a productive way to focus on such links.) Environment Canada will also have to offer some examples as to how to respond; for example, a proposed road will have certain direct effects, and, if it increases access, indirect effects as well; tax policies that support investment in primary industry will have certain direct effects but, if they stimulate greater energy efficiency, offsetting indirect effects.

Ideally, the submission should also indicate what options have been considered to reduce environmental impacts.

## Priorities and Planning Committee

It is doubtful whether sustainable-development concepts can become important cross-sectoral influences on federal policy in Canada so long as the Minister of the Environment is not a member of the Priorities and Planning Committee. This Committee is probably the most important of the committees that constitute a subset of the full Cabinet. Planning in this Government is fairly centralized, with direction coming clearly from the Prime Minister and Priorities and Planning. Broad direction is established by "P&P" each spring, which sets the stage for allocations to each "envelope" during the summer, followed by more detailed and sectoral priorities. The budget process then starts with a discussion within Priorities and Planning and proceeds to completion by February.

Priorities and Planning is thus "the eye of the needle" through which all direction and decision-making must pass. It is the strongest position from which any minister could influence priorities and decisions at earliest and later stages. The current absence of the Minister of the Environment from the Priorities and Planning Committee is evidence of the fact that the environment portfolio is considered neither central nor relevant to economic choices in Canada.

## Senior Management Training

To an increasing extent, senior managers in the Federal Public Service receive specialized training as they move up through the bureaucratic ranks. Much of that training occurs not far from Ottawa at the Centre in Touraine, Quebec. These programs offer special opportunities to introduce environmental concepts into the thinking of managers at a point in their careers where they could make use of them in subsequent assignments. Such a course should include both the ecological and the economic concepts of environment, and should present the analytical techniques for bringing the two together in actual decisions. The role of the public and of voluntary organizations should be emphasized.

There is no problem finding suitable educational and training materials on the environment. The problem is finding time in an already heavy training load for an environmental component. However, this is no different from the problem elsewhere in government of getting enough attention for the environment.

## FLEXING SOME MUSCLE IN THE CROSS-SECTORAL GYM

Getting active with Cabinet level discussions will expand the influence of Environment Canada but more is needed. In particular, Environment Canada needs to think about playing a strong role in areas of policy that are not explicitly environmental. Of these policies, four stand out as critical:

- **fiscal policy**
- **regional development policy**
- **defense policy**
- **foreign policy.**

Each of these policies will be discussed very briefly. Full development of any would require an extensive paper. One broad policy area is put to one side - the question of the appropriate rate of economic growth. The Brundtland Report is more than a little too optimistic about the mutually supportive links between environment and economics, and it has come in for some quiet criticism in this regard (Porritt 1986; Harman 1987). Moreover, it ignored some good economic analysis to the effect that the concept of continued growth is not economically sound (Daly 1978). However, this topic is very broad and better approached obliquely. It may well be argued that, in the end, there is no near-term policy conflict between what the World Commission urges and what slow growth and ecologically oriented economists would like to see.

### Fiscal Policy

Fiscal policy is the heartland of any government. An extremely complex subject that pushes economic and political analysis to its limits, it too is probably better described as process than as result. The issue from an environmental point of view is simple: with rare exceptions, the environment is simply invisible when creating fiscal policy, yet fiscal policy choices can have enormous implications on sustainable development. Tax laws, for example, can encourage or discourage recycling; tax expenditures can encourage or discourage the rate of resource development; direct subsidies can encourage or discourage the purchase of pollution control equipment.

Fiscal systems are never neutral among classes, regions or sectors; the relevant question is only whether neutrality is a goal to be sought. In the case of environmental issues, a case could be made that the objective is not the proverbial level playing field, but a field tilted toward sustainability.

Introduction of environmental considerations into fiscal policy will certainly be difficult. Environment Canada will never be a major player at the time a new budget is being prepared. The goal needs to be more modest, essentially to make the environment visible and important in the eyes of those who are major players. This requires the gathering and submission of enough evidence to convince them that ignorance of environmental implications will jeopardize the very budget programs they are putting forward. Unfortunately, environmental jeopardies (including public health) will most often have a time dimension considerably longer than that of the typical budget. No specific additional information will alter this dilemma. Only by active participation of the Minister of Cabinet and forceful communication to bureaucrats of the need for longer-term optimization will the problem be overcome.

## Regional Development Policy

Environment Canada can play a greater role in regional development policies only if it can present good evidence on the long-term sustainability of different options, and indicate how more sustainable options will affect different groups and different sectors. Resource-development proposals are key (witness the awkward coalitions of forces supporting and opposing that most controversial of all issues, uranium mining). This is one area where the Brundtland Report is not as clear as it should be. Its positive attitude toward economic growth as a way of resolving environmental problems is all too easily misconstrued. Economic growth is fine; growth in aggregate use of natural resources is not (Goodland and Leduc 1985). These two must be particularly carefully distinguished in Canada where resource extraction has played so strong a role in regional development. Unfortunately, this thrusts Environment Canada right into the middle of provincial jurisdiction where, as with any federal entity, it must step with the greatest caution.

Despite the evident problems, Environment Canada should begin to introduce questions about sustainability into discussions about both general regional-development policies and specific regional-development proposals, even where the particular actions are within provincial jurisdiction. This will require both top-down and bottom-up activities - work with senior bureaucrats and work with local officials. It will also require the application of concepts such as safe minimum standards and avoidance of irreversible changes, on the one hand, and of notions about "empowerment" of regions on the other.

The Brundtland Report includes a useful chapter on urban concerns. Again, this is a difficult area constitutionally for the Federal Government. However, to a considerable degree, the issue of sustainability is similar to that for regional concerns except that resource extraction per se is limited within the city. The issues involve increasing simultaneously the sustainability of the urban environment and of the urban economy. There are many ways in which cities could become more self-sufficient to their benefit, which would in turn provide for their own empowerment.

Both urban and regional issues depend upon developing sound linkages between federal and provincial officials at both the political and the bureaucratic levels. Perhaps CCREM is a good means by which to stimulate such a process, but it is unlikely to be the only one. In many cases channels for joint effort already exist at the working level and only need to be extended to the policy level. The important point is not to let constitutional barriers with respect to ultimate authority intrude upon discussion about, and joint action in support of more sustainable resource and development policies.

## Defence Policy

Only recently have the links between military policies and environmental problems been widely admitted. (Here as elsewhere in this report "environmental" should be read as including human health.) Yet environmental disruption resulting from war is described in documents as old as the Bible. Much has been made of the environmental problems that will result from what is now euphemistically called a nuclear exchange. However, those resulting from the plethora of limited conventional

wars around the globe are locally more serious. Some problems result from deliberate action, as with use of pesticides for deforestation; others result indirectly, as with the disruption of carefully managed irrigation systems; and still others result from actions of refugees whose objective is to survive until next week (Torrie 1986).

Clearly, the Canadian Government bears some responsibility for the effects of western defence policies. For one thing, the national defence budget is increasing with little indication of least-cost concepts playing much, if any, role in military decisions (nuclear submarines being an excellent case in point). For another, Canadian manufacturers of arms and armaments are moving into the export trade, and major markets for that trade lie in the Third World, which can ill afford them. For still a third, Canada has exhibited remarkably little resistance to global militarization, for all of our image as a peace-maker.

The Brundtland Report, to its credit, did not follow the course of most predecessor reports and ignore the linkages between military actions and sustainable development. Within Canada, Environment Canada should be equally forthright and insist upon its right to emphasize the same concerns. When possible, the Minister should remind his Cabinet colleagues that all the aid in the world will not do much good (nor will any financial debts be repaid) if the militarization of the Third World continues at today's pace.

## Foreign Policy

The Brundtland Report coined the useful term "a foreign policy for the Environment". While almost any aspect of foreign policy could be construed to have environmental implications, the specific focus of concern here involves international development, including both bilateral and multilateral aid, as well as international finance and trade policies. This focus is emphasized because it is perhaps less known than other areas where environmental and foreign policy intersect. It should not be read as implying lack of concern for Canada's role in other international fora. Notably, Environment Canada should be taking a leadership position on international environmental issues, including both those related to specific problem areas (ozone, greenhouse gases) and those related to international institutions (UNEP, International Joint Commission).

There is something of an irony apparent in Canada's foreign policy so far as it concerns the environment. Domestically Canada exhibits a relatively high level of environmental awareness and concern, yet in those areas of international development where Canada has played its strongest role - notably in the electrical and agricultural sectors - environmental concerns have been all but absent, and we have made mistakes abroad at least as bad as we have made in Canada (Erhardt 1981; Greene 1985; Adams and Solomon 1985; Goldsmith and Hildyard 1986; Brooks 1986). In some arenas, such as the United Nations and The Organization of Economic and Cooperative Development (OECD), Canada plays a strong role in support of international action, yet in those where we should be most active, as with transborder air pollution from the United States, we are remarkably accepting of the most modest steps.

Returning to the focus on international development, steps are just now being taken to ensure that bilateral aid projects satisfy at least the assessment aspects of

the environmental assessments and reviews that are applied to federal undertakings within Canada. This is a process that has long been argued for by Environment Canada but that might still be lagging in the absence of strong extra-bureaucratic initiatives coming, notably, from non-governmental organizations.

It is too early to say anything about how well this process will work, but it is disturbing that no commitment has yet been made to make the environmental assessments public and that no provision appears to have been included relative to reviews within the host country for the aid project. Also, it appears that the reviews will focus on project assessment, rather than on either identifying smaller-scale or community-focused alternatives that might reduce adverse environmental impacts. Nor does there appear to be any commitment to environmental review of development policies, notably for review of purported level of resource demand, which typically indicates that the "need" for massive projects is less than at first appears. It is hard to see how, in the absence of careful attention to such smaller-scale and policy alternatives, the Brundtland call for sustainable-development policies in the Third World can be achieved.

A foreign policy for the environment must also include multilateral development banks. These agencies at present operate almost without control, economic or environmental, and their record with the latter is by no means good.

The fact that the critique of the environmental record of multilateral banks has reached the front page of the Business Section of **The Globe & Mail** (July 23, 1987) is perhaps as good an indicator as any that the issue has come of age. Environment Canada might well insist upon some opportunity to review proposed projects of the development banks to which Canada contributes - and far enough in advance of approval to recommend substantive change - a process that, at present, is barely accessible to Canadian directors of those banks. Among multilateral development banks, only the World Bank has any significant capability for investigation of environmental impacts, and its capability is currently being strengthened. As with the new procedures within the Canadian International Development Agency (CIDA), it will be necessary to monitor this carefully.

Ultimately, development is a process, just as is conservation, and Environment Canada should insert itself into discussions about Canada's role in international development rather than leaving the field entirely to CIDA (for aid projects) and the Ministry of Finance (for multilateral banks). Sustainable development depends upon a point of view as much as on specific technique, and Environment Canada is in a good position to argue for sustainability of the development process. Even a minor expansion of this perspective implies the need to say something explicit about Third World debt. The financial profits of Canadian (and other) banks are simply less important than the damage being wreaked on Third World environments by the need to export cash crops or resources as rapidly as possible simply to pay interest on a debt for which both the First and the Third Worlds bear responsibility.

## CONCLUSION

The focus in this paper has been on ways for Environment Canada to promote greater attention in Canada, and particularly for issues within federal jurisdiction, to the implications of the Brundtland Report. A variety of suggestions have been made for changes in methods of operation and in structures, all of which are to be seen as supplementary to changes required in our use and management of natural resources (Schrecker 1987, forthcoming).

Taken together, the suggestions in this and other reports would go far toward realizing the eating-our-cake-having-it-too promise contained in the Brundtland Report. Not every suggestion will be adopted nor is every one necessary, but a substantial proportion will have to be accepted formally or informally if progress is to be made.

However, the real question is whether, even assuming acceptance of a considerable number of reforms, a sufficient set of conditions will have been established for sustainable development. My contention is that the reforms are necessary but not sufficient. They cannot be neglected but ultimately they represent tactical, not strategic, measures. As emphasized in a draft paper circulated by Goodland and Ledec of The World Bank (1985), and perhaps even more fundamentally in the revisionist economic theories of Herman Daly (1977), a strategic change in perspective is required. Society must draw back from the unlimited resources/infinite wants and society-equals-the-sum-of-individuals approaches that underlie today's policy prescriptions and programme choices.

How can a **strategic** shift toward sustainable development be encouraged? There are four ways, none of which is very radical: First, by promoting the tactical changes suggested in the Brundtland Report itself and in this and in other follow-up documents. Second, by emphasizing the theoretical and practical viability of the alternative, so that it becomes thinkable for decision makers. (This is where clarification of the economic concepts becomes critical.) Third, by working to reduce the institutional barriers that serve to block shifts in the direction of sustainable development - and there are many such barriers. And, fourth, by providing some leadership at the top.

The first three of the methods to promote a strategic shift toward sustainable development involve all aspects of, first, Environment Canada and, then, the Government of Canada. The fourth could be the principal platform of the Minister. Nearly a decade-and-a-half ago, then Prime Minister Trudeau was leading the nation in his open and favorable references to a conserver society for Canada. The Prime Minister's interest in the conserver society, and as a partial result public interest, declined as the economy sagged and oil prices rose in the late 1970s - a shift that reflected a failure of both the Government and that loose coalition of forces that could be called the conserver society movement to recognize the intimate linkages between economic and environmental health.

With publication of the Brundtland Report, a new base has been established for discussions of a conserver society (albeit under the rubric of sustainable development). Moreover, this new base has been established not by the purportedly esoteric members of the Science Council or the visionaries of Friends of the Earth, but by a collection of hard-headed politicians from around the world. If the Minister misses this opportunity, it will be not so much at his peril as at ours.

## APPENDIX

Excerpt from "Improved Program Delivery: Environment, the Report of the Study Team on the Programs of the Minister of the Environment to the Task Force on Program Review 10 July 1985."

> "Besides the challenges faced by all government agencies in defining an appropriate role and in determining the best way of fulfilling that role, and the fact that the department has the characteristics of a conglomerate, DOE faces four problems that, if not wholly unique, are at least much less important for other federal departments: a) it has a very large informal mandate, b) it is inherently impossible to define an optimum level of service, c) it needs to serve as advocate as well as broker, and d) it plays the role of both a line department and a ministry of state.
>
> a. DOE's formal mandate is described in the DOE Act and in the department's policy statements. However, it is given an even larger informal mandate by the Canadian public, for whom the department represents the concept of "environment" with all that word has come to connote. The public is not much concerned with jurisdictional lines between federal and provincial authorities, much less among federal departments; if there is an environmental threat, they expect DOE to be prepared to do something about it, or even to have done something earlier that would have prevented the problem.
>
> b. Adding to the practical difficulties of an informal mandate is a theoretical one: there is no principle or analysis which DOE can use to learn how much environmental protection or how much heritage preservation is enough. This does not mean that the answers are devoid of analytical content - it is, for example, critical to determine what it will cost to achieve different levels of risk or of species preservation - but it does mean that the ultimate choices about actions and investments must be determined politically.
>
> c. Partly as a result of the preceding two problems, DOE must serve as an environmental advocate as well as a broker of information about the environment. The problem is that, in terms of its formal mandate, credibility lies with the brokering functions whereas, when it comes to its informal mandate, credibility lies on the side of advocacy. Moreover, the functions of broker and of advocate will overlap and it is naive to think that they can be kept as separate as models of economic and political behaviour suggest. Therefore, the department will always have to be both advocate and broker, though by no means equally in all sectors and for all issues. Its goal should not be to

eliminate one or the other of these functions, but rather to know (and to make clear to the public) when it is exercising one function and when the other.

d. Finally, DOE serves as both a line organization delivering programs and also as a ministry of state trying to influence the policies and programs of other government departments. To a considerable degree the two activities are synonymous with a reactive and an active role. The nature of environmental issues is such that, once a problem has been identified (e.g., acid rain), the department may well have lead responsibility for action but, in order to reduce or avoid a problem (e.g., electricity conservation and recycling of metals), the department will generally have to work in the areas of responsibility of other agencies or even other jurisdictions."

## CITATIONS

Full references to any of the publications and reports cited in this report will be supplied upon request.

ANNEX 5

# RESPONDING TO BRUNDTLAND

Report prepared for the
Canadian Environmental Advisory Council

by

Ted Schrecker - Research and Consulting

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"Politics, power, and competing interests have been with man since his emergence from the soup. There is no reason to expect their immediate extinction for the convenience of development workers. Furthermore, bewailing the unequal distribution of power is about as conducive to resolving 'essentially political' problems as bewailing the unequal distribution of rainfall is to resolving 'essentially agricultural' ones. Good policy analysis, as opposed to good intentions, consists in learning to understand the constraints of power .. and in learning to shape feasible programs within the limits they impose."

B. Johnston and W. Clark, **Redesigning Rural Development: A Strategic Perspective** (Baltimore: Johns Hopkins University Press, 1982), p. 13.

"You may think that I'm not being very practical. I have learned that practical means something that can be done while keeping everything else the same."

C. MacKinnon, **Feminism Unmodified: Discourses on Life and Law** (Cambridge, MA: Harvard University Press), p. 70.

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## INTRODUCTION

The report of the World Commission on Environment and Development[1] is the latest, and most compelling, in a series of recent international-scale investigations of the relationship between environment and economic development. The report itself is less notable for the sophistication of its analysis than for the high profile and high levels of support afforded to the Commission's activities in both rich and poor countries. This, and the fact that the report will be formally addressed by the United Nations General Assembly, provide some grounds for hoping that the Commission's work will serve as a catalyst for change in the relationships between economies and the resource bases which ultimately support them.

There exists a fundamental tension within the discourse concerning environment and economic activity: it tends to be indifferent to inter- and intra- national differences in wealth and political efficacity. Thus Dr. Brundtland, who chaired the Commission, quite correctly notes that "the 'environment' is where we all live; and 'development' is what we all do in attempting to improve our lot within that abode."[2] Yet it is also important to keep in mind the comment made by Enzensberger more than a decade ago, in a critique of the "spaceship earth" metaphor which remains essential reading for anyone seriously interested in questions of ecology and economy: "The ideological purpose of such hasty global projections is clear. The aim is to deny once and for all that little difference between first class and steerage, between the bridge and the engine room."[3]

How should Canada respond to the WCED report? Sensitivity to distributional issues is obviously necessary, but hardly sufficient. The present paper begins by focussing on several areas of Canadian domestic policy to which the Commission's report is directly relevant, and goes on briefly to discuss Canadian official development assistance. This is admittedly just one aspect of Canada's role in the international community. Further research is urgently needed on the implications of Canada's place in the international economy, and the changing international economy itself, for environment protection both in Canada and in the poor countries.[4] It should also be emphasized that the present paper relies heavily on illustrative examples, rather than comprehensive inventories of problems, and raises questions rather than proposing solutions. The point is to suggest that these and related questions should be given much higher priority in the agenda of public debate, of public policy, and of political leaders, than has been the case until now.

Two central themes run through the paper. The first of these is that in many structural respects, ours is a Third World economy. This creates a number of serious internal political and institutional pressures which work against proper, long-term resource management. These pressures are hardly unique to Canada, or indeed even to resource-dependent economies. Canada enjoys (at least for the moment) the advantage of great wealth, but at the same time is often unable successfully to resolve even small-scale conflicts involving individuals, and communities, whose livelihoods are dependent on non-sustainable and even destructive uses of resources.

(The recent controversy involving logging of wilderness areas in the Temagami region of Ontario is a case in point.) Hence, the second theme of this paper: if relatively rich Canada cannot get its internal act together, our pronouncements on environmental questions will neither have nor deserve much credibility with poor countries which face far harsher tradeoffs between short-term and long-term economic policy and resource management objectives.

## CANADA AS A "DEVELOPING COUNTRY"?

Only by virtue of the earnings from resource exports can Canadians finance the standard of living, and more specifically the high consumption of finished, manufactured products, characteristic of today's industrial economies. In 1983, Canada enjoyed a trade surplus with the rest of the world of $30.3 billion, and a net trade shortfall in manufactured products of $16.8 billion.[5] Canada's manufacturing sector appears weakest in precisely those areas of manufactured products where international market growth has recently been most rapid, such as data processing and telecommunications equipment.[6] In addition to the jobs exported when Canada imports finished products, employment in at least some manufacturing industries is further reduced in significance as a source of income for Canadians by virtue of the truncation characteristic of those Canadian operations which do exist; many functions which involve relatively highly skilled work, such as design, engineering and product planning, are carried out at head offices in other countries.[7]

Individual regions within Canada tend to be even more heavily reliant on the production of raw and semi-processed commodities than this national picture would indicate. The Macdonald Commission observed that:

> "... while the natural resource sector no longer looms as large in the national economy as it once did, it continues to dominate the economic life of some provinces, some areas within every province, and many localities. Grain prices are still important in Saskatoon, as are fish landings in St. John's. And many Canadians are only too familiar with the fact that in one-industry towns, a downturn in demand for minerals or plywood can mean the death of the community. In many ways, it is misleading to talk in general or national terms about dependence on resource."[8]

And because of Canada's federal structure, the resource-dependence of particular regional economies is far more directly relevant than aggregate national figures to the relationship between resource management policies and the realities of the political process. As a way of assessing that dependence and overcoming the limitations of conventional statistical measures, Jenkin isolated the five leading goods-producing industries in each province, in terms of their percentage contribution to total industrial activity in the province in 1975, as measured by value added. He found that at least three primary resource or resource-based industries (the latter including paper and allied products, food and beverages, and wood industries) were among the top five goods-producing industries in every Canadian province except Ontario and Quebec, with the resource-based percentage of total value added in goods-producing industries being above 49 percent (in Manitoba), 54 percent (in British Columbia), and 78 percent (in Alberta).[9] Even these figures fail to reflect the resource dependence of the economies of northern Ontario and northern Quebec, and the economic importance in absolute terms of the forest and mining industries in those provinces.

Jenkin also excluded electric-power generation from his calculations although this is arguably a goods-producing industry, clearly relies directly on natural resources, whether coal, uranium or hydroelectric potential, and (as noted later on in this paper) is increasingly oriented toward export markets. The author's own recalculation of Jenkin's figures for the year 1979, using Jenkin's methodology but including electric power production, found electric-power production to be one of the top five industries in every province except Saskatchewan and Ontario. Even in Ontario, Ontario Hydro's massive electrical energy production accounted for the same percentage of value added as mining, and only slightly less than the machinery industry.[10]

The situation just outlined makes Canada's regional economies extremely vulnerable to such exogenous events as falling commodity prices, changes in product markets, and deteriorating terms of trade. "By early 1986," according to the Economic Council of Canada, "in relation to the prices of manufactured goods and services, raw material prices were at their lowest levels in recorded history."[11] Late in 1986, Reuber noted that: "The real price of wheat is down 46 percent since 1980, metals and mineral prices are down 42 percent, pulp and paper by 26 percent and crude petroleum some 73 percent." The resulting deterioration in Canada's terms of trade contrasted sharply with the improvement over the same period of the terms of trade for the United States, West Germany and (especially) Japan.[12] In fact, most of Canada's regional economies are what Jane Jacobs has termed "supply regions" for metropolitan economies both within and (especially) outside Canada.[13] Particularly important for Canada are her observations that regions may be more appropriate units than nations for the analysis of economic life, and that "the difference between a rich backward economy and a poor backward economy is not all that great. Rich or poor, supply regions are inherently overspecialized and wildly unbalanced economies, hence unresilient and fragile, helpless when they lose their fragments of distant markets."[14] Development theorist Samir Amin has similarly isolated extraversion and disarticulation as central structural characteristics of underdeveloped economies. Extraversion refers to the tendency of such economies to be oriented toward external markets and capital sources; disarticulation refers to the corollary fact that the flow of internal exchanges between the sectors of an extraverted economy is relatively weak, since many sectors are oriented toward exporting or importing.[15] One consequence of disarticulation is that leakages of demand make the national economy peculiarly unresponsive to the conventional tools of fiscal policy- an observation made with increasing frequency about Canada.[16]

The analogy between Canada and the Third World must not be carried too far. Canada is still an extremely wealthy country. That wealth means, among other things, the existence of a substantial national constituency for measures to protect the domestic environment and conserve resources even at the expense of short-term maximization of returns - a constituency whose existence is illustrated by the recent outcry over proposed logging on British Columbia's South Moresby island. Yet that constituency often tends, as one commentator has remarked, to comprise people from "outside the 'production core'"[17]; the economic activities on which their livelihoods depend are seldom directly dependent on resource exploitation, or even on industrial production. In Canada, the class conflicts thus created (defined in terms of jobs versus the environment) are also regional conflicts. Outside the Quebec-Windsor corridor, Vancouver and a few heat islands on the prairies, Canada is largely a

single-industry economy, although the particular resource industry in question varies from region to region. But wealth, and the possibility of its redistribution, confer a powerful advantage on any society in terms of resolving such conflicts. In extremely broad terms, the central challenge facing Canadian policy-makers as they respond to Brundtland and to the imperative of sustainability is devising ways to use this advantage which create the possibility for creative policy, and avoid political paralysis.

## CANADA'S ENDANGERED RENEWABLE RESOURCES: SOME ILLUSTRATIVE CASES

Supply-region status has at least two distinct consequences in terms of economic, and environmental, policy. One is the orientation of resource-development and management policies toward "province-building", with an emphasis on external markets. This tendency has been most widely discussed with reference to oil and gas development, but potash in Saskatchewan, forest products in British Columbia, and hydroelectricity in Quebec and Manitoba do not exhaust the list of other examples.[18] The result is to hasten ecological degradation and inappropriate resource uses: both individual resource users and governments which depend on resource-related revenues for continued solvency, and on the superficial health of resource-based economic activities for continued electoral success, neglect long-term conservation measures which are associated with significant short-term (economic or political) costs. As journalist Geoffrey Stevens noted in 1979: "Politicians measure the future in terms of the number of days, weeks, or months left to conquer the closest problem. The real future has to wait until the present is under control."[19] A second, and related consequence of supply-region status is that governments try to counteract the effect of events in external markets by increasing levels of internal (direct and indirect) subsidy to producers. This presents the possibility of financial ruin, particularly if we accept the proposition that the current deterioration in the terms of trade for primary-commodity producers is a manifestation of a long-term trend, and that the anomalous recent case of fossil fuel prices between 1973 and 1982 is merely the exception which proves the rule.[20]

Agricultural policy provides a useful example of both tendencies. Canadian agriculture today faces an economic crisis, the single most crucial element of which involves loss of international wheat market share as the result of a subsidy war between the United States and the European Economic Community (EEC).[21] The United States has determined to spend "an estimated $20 billion over the next five years" on wheat subsidies; "... swimming against a red tide of annual deficits, all the federal government can offer is a pledge of $1 billion for all grain producers"[22] in addition to existing subsidies. It is cruelly ironic that, in a world where hundreds of millions of people are malnourished or starving, wheat is coming out of our ears" as a result of continued increases in agricultural productivity.[23] In this context of abundance, such high subsidies to developed-country food production are undesirable for several reasons. The artificially low price of subsidized grain exports depresses the prices received by farmers in developing countries, encouraging continued reliance on artificially cheap import and slowing down or even stalling the process of agricultural modernization in those countries.[24] Subsidies of the magnitude now being provided in Canada, especially when market conditions suggest that they may well evolve into long-term commitments,[25] further reduce the financial flexibility of governments - and, in an additional irony, increase the pressure on them to maximize growth in other areas of resource development which provide tax or royalty revenues.

Even more significantly, financially hard-pressed farmers compete with one another to maintain their livelihoods by increasing production through more intensive cultivation and further inputs of fertilizers and pesticides, aided by public policies whose main objective continues to be increased yields. This Aggravates the overall crises of overproduction; even more importantly, the effect is to worsen the environmental impacts of agricultural practices which are already acknowledged as highly destructive. The 1984 Senate Committee report, **Soil at Risk**, noted that:

> "To date one of the major drawbacks to soil conservation [sic] has been the emphasis on increased production. This has resulted in the creation of policies which have ignored or unintentionally worked against good commodity management. Low commodity prices and high input costs have also pushed farmers to continuously increase yields-simply to remain financially afloat."[26]

The report went on to observe that:

> "... as much as 40 to 60% of the organic matter present in virgin prairie soils has been 'used up' by farm production" and "while the native soils in parts of the prairies originally released up to 125 pounds of nitrogen par acre ... per year, the same soil today may deliver as low as 9 pounds per acre ... if nitrogen fertilizer has not been used. The practical result for the farmer is that he must apply ever-increasing amounts of nitrogen fertilizer in an attempts to hold production at its current level."[27]

Predictably, Canadian fertilizer use has increased dramatically over the past few decades.[28] The loss of organic matter is far from the only adverse effect of agricultural practices on soil; others include erosion and salinization, both of which (at least on the prairies) are directly linked to the widespread practice of summerfallowing.[29]

As noted later in the paper, serious attention to ecology-economy linkages demands far more than merely more extensive or technically sophisticated assessment of the dollar costs of environmental impacts. However, soil degradation is an excellent example of such an impact whose direct economic costs are both substantial and sensibly quantifiable. Agriculture Canada cites estimates that water erosion costs Canadian farmers between $266 million and $382 million per year; wind erosion between $218 and $225 million; soil compaction between $125 and $200 million (excluding the prairie provinces, estimates for which are not available); and soil salinization resulting from irrigation and summerfallowing between $104 million and $257 million on the prairies alone.[30] Soil erosion also creates substantial costs off the farm; Agriculture Canada estimates the value of damage to Ontario fisheries from soil erosion caused by agricultural practices as more than $74 million a year.[31] In addition, increased reliance on pesticides and fertilizers creates pollution problems resulting from nutrient runoff and the dispersion of large volumes of toxic substances in the biosphere. Yet without major changes in economic policy as it affects agriculture (for instance, shifting incentives to reward **reduced** production, particularly when associated with soil conservation initiatives) it is reasonable to expect that all these problems will get worse before they get better, if they do so at all.

## SEEING NEITHER THE FOREST, NOR THE TREES

Forest products constitute by far the largest single component of Canada's trade surplus; "...forestry's contribution to Canada's balance of payments is more than the combined total trade of farm products, food, metals and the auto industries",[32] and the forest industries are a mainstay of a number of regional economies. Yet Canada's treatment of the forest-resource base is another disturbing (and, by now, familiar) illustration of the current and potential impacts of lack of attention to sustainability. Robert Repetto observes in a highly perceptive discussion of the context for forest policy in developing countries that governments "impelled to raise foreign exchange earnings and domestic revenues turn to the forests as a resource that can readily be exploited." He argues that governments' failure to collect the economic rents from forest exploitation - in particular the widespread use of generous concessions for logging on public lands negotiated on an ad hoc basis, rather than competitive bidding, as a way of stimulating rapid development - is an instance of both environmental and economic mismanagement.[33] The effect is to reduce revenues and to price the resource artificially low, expanding export markets but also increasing the pressure on the resource base.

What Repetto says about countries like Ghana, Indonesia and the Philippines applies equally to Canada, because of the structural economic factors outlined in the first section of the paper. The two most striking and widely agreed-upon characteristics of Canadian forest management are the lack of sufficient expenditures on forest regeneration, which have led to anticipated wood supply problems for the forest industry in many parts of Canada,[34] and the almost complete absence of competitive bidding for rights to harvest timber on Crown land. Lack of proper forest regeneration has led to sometimes-dramatic reductions in allowable cuts,[35] and governments under pressure to keep sawmills and pulp mills operating almost at any cost have responded to the prospect of wood shortages by opening up more and more land for "tree mining". With increasing frequency, the result will be destruction of wilderness areas like portions of the Queen Charlotte Islands and the Stikine Valley in British Columbia and the Temagami region in Ontario which merit protection for reasons either economic or non-economic.[36] Similar pressures have arguably been behind federal and provincial authorities' reluctance to take serious action against pulp mills, many of which have still not reduced their effluent levels to achieve water-pollution reduction targets set out by the federal government more than 15 years ago.

The absence of competitive bidding for harvesting rights drastically reduces the resource rents received by government.[37] One recent estimate is that in British Columbia alone, government's failure to allocate harvesting rights on the basis of competitive bidding resulted in a loss to the public treasury of about $1.4 billion between 1980-81 and 1984-85.[38] This is a clear sacrifice of proper pricing of a resource in the interests of improved market share - an international loss leader, as it were. It does not take much imagination to connect the failure to collect the economic rents from forest resources with the shortage of funds for forest regeneration. It takes considerably more imagination to see a political way out of the dilemma faced by governments (like those of many Canadian provinces) which depend heavily on the forest industries for job-creation and tax revenues yet must, in the interests of sustainability and common sense, take a much tougher stand in imposing conditions for harvesting and in pricing the forest resource. If this cannot be

achieved, it is probably pointless to talk either about sustainable forest management or about the desirability of preserving some forest areas for competing, non-consumptive uses.

These are by no means the only important instances of unwise Canadian practices in the management of renewable resources. To provide just one further example, fisheries are perhaps the most familiar case of Hardin's "tragedy of the commons" in contemporary resource management. Both Canada's coastal fisheries suffer from severe problems of overcapacity. The economic dependence of the coastal regions (the Atlantic provinces, in particular) on the fishery creates formidable political obstacles to reducing that over-capacity and restricting harvesting rights, yet failure to do so creates the twin problems of glutted markets and a resource base potentially endangered by overfishing.[39] The examples of Canada's forests, agriculture, and fisheries all underscore the wisdom of the Brundtland Commission's general conclusion that: "Governments should examine whether existing economic policies, instruments, or subsidies provided to various industry-based programmes and projects contribute effectively to the promotion of environmentally sound and resource-efficient practices"[40] - a recommendation which should be applied to all areas of economic activity. They also show the need for hard political choices at the national and sub-national levels if sustainability is to be taken seriously. This is just as important for Canada, a resource-dependent rich country, as it is for resource-dependent poor countries. Finally, they demonstrate that despite the fatal weaknesses of conventional economic approaches, taken on their own, in making environmental and resource management decisions, there is also a great deal that can and must be learned from them.

## NON-RENEWABLE RESOURCES: THE PARABLE OF PINE POINT

Extensive environmental impacts are often associated with both renewable and non-renewable resource development, and Canada's record in controlling these impacts has not, at least until very recently, been very impressive. Apart from these impacts, however, the problems confronting management on non-renewable resources differ from those associated with resources like forests, soils and fisheries. Since the resource base is by definition exhaustible, to the vulnerabilities associated with reliance on primary resource industries in general (including the difficulty of imposing environmental control requirements on industries which are key providers of a region's income and employment) is added the certainty, rather than merely the possibility, of eventual exhaustion of the resource base. And since economic exhaustion invariably precedes physical exhaustion, the rate of extraction, and the distribution of rents resulting from extraction, become the crucial economic variables.[41] Management of renewable resources shows concern for the future by ensuring the continued health of the resource base; management of exhaustible resources can show similar concern by ensuring that resource rents are maximized, and that they are distributed in a way consistent with the values of the society to which those resources belong.

Despite the last decade's debates over fossil fuel pricing in Canada, this latter point deserves to be restated because it remains widely misunderstood. Even given the maximization and satisfactory distribution of resource rents, the case of Pine Point Mine serves as a fine illustration of the precariousness of basing economic strategy on mineral resource exploitation. The mine was first developed in the 1960s, with extensive federal government assistance including subsidies for the construction of the Great Slave Lake Railway, based on a proposal from Cominco Ltd. which emphasized the jobs, tax revenues and export earnings which would result.[42] In 1978, Macpherson noted that "Pine Point has proven to be one of the most profitable mining ventures in Canada's history," suggesting that the federal subsidy for Great Slave Lake Railway had been unnecessary and that a substantial proportion of the rents from the project had been captured as excess profits rather than as taxes and royalties.[43] This is an important point, since public capture of rents from resources extracted from Crown land is arguably the principal mechanism by which future potential users can be compensated for the exhaustion of the resource base. By the end of 1985, Pine Point announced "that it [had] established a two-year plan to take out higher grade ore" and to run its mill at full capacity. Meanwhile, the firm would set up a termination fund for employees, reflecting probable plans to abandon Pine Point at the end of the two-year period in favor of developing new lead and zinc deposits in Alaska.[44]

This is not a unique case; in fact, it is probably depressingly typical, and it is not intended as criticism of Cominco. Rather, it highlights the dangers of depending on mineral resources as the basis for economic development. As a corollary, the wisdom of continuing to allocate limited public financial resources to stimulating mineral development - for instance through tax expenditures - should perhaps be reassessed in view of its inherently limited life span and, of course, in view of the extensive environmental damage which so often accompanies mining, milling and smelting operations.[45]

## ENERGY: A SPECIAL CASE

Energy is a special case in resource management because it is both a uniquely essential input for all forms of economic activity and a highly lucrative product in its own right. This combination is particularly important for Canadian energy policy. Energy has historically been developed as a staple export and, because of the economic importance of uranium mining (in Saskatchewan and Ontario) and electric power production as well as oil and gas extraction, almost every province in Canada is effectively in the energy business in a substantial way. Consequently, Canada faces fundamental conflicts between the imperative of increasing energy efficiency in the future and the politically more powerful imperative of increasing production.

Analysts who agree that access to energy is essential for economic development, whether in rich countries or in poor countries, differ drastically on the question of **how much**, and how much more, energy is needed. An International Institute for Applied Systems Analysis energy study team has projected global primary energy requirements of 35 TWyr/yr in 2030[46] (roughly 3.5 times 1984 levels). However, it is now widely recognized that, based on the great potential for increasing the end-use efficiency of energy consumption, levels of GDP/capita approximating those in today's industrial economies are technically compatible with consuming primary energy at only a fraction of today's per capita levels. In a particularly persuasive analysis, Goldemberg and co-workers demonstrate, using a wealth of technical detail, that today's state-of-the-art end-use technology, if generally adopted, would support a standard of living comparable to today's in Western Europe at a level of per capita energy use roughly comparable to today's levels in developing countries.[47] This is so, they conclude, despite the high levels of activity in the relatively energy-intensive basic materials industries which are associated with developing the infrastructure for a modern commercial and industrial economy. In addition, marginal-cost comparisons of improvements in end-use efficiency with investments in additional energy supply or generation consistently show that end-use efficiency improvements are far more attractive in terms of usable energy resulting from a given investment[48], even before the environmental costs of new energy supply and use are considered.

Critics of such low-energy scenarios for both rich and poor countries, like the IIASA energy study team, tend to base their objections on anecdotal or impressionistic views of the slowness with which the transition to energy-efficient end uses can be brought about, rather than on either technical capabilities or economic factors.[49] The Brundtland report expresses some similar reservations about the speed with which an "energy efficiency revolution" can be achieved. However, it recognizes that global high-energy futures in the IIASA mould imply accepting some combination of serious environmental consequences such as environmental pollution and possible climatic change resulting from increased fossil fuel consumption and the hazards of water disposal, risks of nuclear accident and hazards of weapons proliferation associated with the rapid spread of nuclear electric generation.[50] It concludes that:

> "... there is no other realistic option [than low-energy futures] open to the world for the 21st century. The ideas behind these lower scenarios are not fanciful. Energy efficiency has already shown cost-effective results....Properly managed, efficiency measures could allow industrial nations to stabilize their primary energy consumption by the turn of the century. They would also enable developing countries to achieve higher levels of growth with much reduced levels of investment, foreign debt, and environmental damage."[51]

For Canada, such a recommendation presents political problems which tend to bear out Amory Lovins' familiar claim of the institutional incompatibility of "hard" and "soft" energy paths.[52] Future patterns of development in which the widespread adoption of low-energy technologies enables continued increases in per capita GNP while per capita energy use stabilizes or even declines have been sketched out in considerable technical detail for many industrial countries. The most detailed such study for Canada, carried out by Friends of the Earth Canada, is generally credible with the possible exception of estimates of demand for portable transportation fuels.[53] However, it is almost certainly less important to concentrate on numerical targets for future energy consumption than to address the many institutional factors which work against investment in energy efficiency.

Energy users may lack proper information about technical capabilities and potential cost savings, or may be getting the wrong price signals as a result of administrative decisions about the pricing of various forms of energy. Existing energy-supply investments may benefit from substantial subsidies or tax incentives; conversely, energy users may lack access to capital on the same terms or at the same price as major energy suppliers. And decisions which may be "rational" in terms of an energy user's private costs may be profoundly irrational in terms of the social costs implied by the need to provide additional energy supply - suggesting that unequivocal economic justifications exist for such forms of government intervention as energy efficiency standards.[54]

A similar set of difficulties confronts even a modest recommendation like that of the Brundtland report that "... renewable energy sources require a much higher priority in national energy programmes",[55] as part of a global transition to renewable energy sources for the additional energy supplies which will be required in the next century. Institutional vested interests in the allocation of research funds are only the first of these. In 1979, nuclear energy accounted for 68-90 percent of total energy research and development spending in five OECD countries which had nuclear programs; conservation R&D never received more than six percent of energy R&D funding.[56] Much the same pattern characterizes Canada's federal energy R&D spending.[57] There is no constituency for renewable-energy of the type and size needed to influence research budgets in a significant way. As with energy efficiency, the decentralized nature of many renewable-energy supply technologies means that their diffusion depends on adoption by large numbers of users at the point of end use. Some observers actually regard this as an advantage, since it means that renewable energy and conservation technologies can theoretically achieve the same rapid diffusion rates as familiar consumer products; others note that governments invariably have difficulty with programs which mean dealing with large numbers of actors, preferring familiar, centralized solutions like building nuclear power stations or synthetic fuel plants despite their economic and environmental weaknesses.

There is no shortage of promising institutional innovations to promote energy efficiency; indeed, by now there are literally books full of them.[58] Financing energy efficiency improvements is a particularly important area of public policy, since energy users often have limited access to capital and expenditures on energy efficiency must always compete with other priorities. Measures to address this problem could include shared-savings arrangements, joint ventures, energy service agreements and various loan programs;[59] many of these could be delivered through existing utilities (and have been, in the United States). The central problem would appear to be political rather than administrative. In a genuine low-energy future, what would become of Canada's existing "hard" energy industries such as oil, gas, and large-scale electric generation? And on a much smaller and more incremental scale, how are governments to assure employment opportunities to replace those associated with cancelled "megaprojects", even if these are economically dubious and environmentally precarious? This is a more basic conflict than that, recently so divisive within the Canadian federation, over the distribution between producers and consumers of rents from oil and gas production. It is not easy to see how the "political space" for a transition to a low-energy future in Canada will be created, given the current weakness of oil-dependent provincial economies and the attractiveness of public commitments to major nuclear and hydro-electric generation as one of the few forms of fiscal policy which can effectively be implemented to achieve job-creation and capital-investment objectives at the provincial level.

Today, despite the attractiveness of efficiency improvements, policy discussions concerned with energy in the Canadian economy are dominated (as they have been through most of Canada's recent history) by the perceived need to expand both domestic and export energy markets.[60] The plight of the western Canadian oil industry is now familiar to most Canadians; as in the case of other regionally important resource industries adversely affected by international market conditions, the response of the federal government has been to offer additional subsidies.[61] Ontario Hydro's aggressive domestic marketing campaigns for electric residential space-heating, motivated by the need to generate revenues to offset the utility's huge recent investments in new generating capacity, are an equally instructive case in point. And according to Hydro-Quebec's most recent annual report: "In recent years, Hydro-Quebec has actively sought new markets outside Quebec. The objective: to ensure optimum development of available hydraulic resources in order to sustain Quebec's economic development."[62] The economic significance of Canada's energy industries suggests that strong resistance will accompany any serious attempt to reduce the market for their products by reducing or eliminating existing barriers and disincentives to efficient energy use. Further complicating the issue, Canada's high levels of manufactured imports suggest that some of the economic benefits of conservation, specifically those associated with the responding of conservation savings, may not offset the losses in jobs and income associated with a relative decline in the importance of energy supply industries.[63]

Yet a strong case can and must be made for a policy commitment to energy efficiency and renewable energy in Canada. For one thing, conservation buys time to assess (and, we may be permitted to hope, to avoid) the environmental impacts of future large-scale energy supply developments (and of continued or expanded consumption of energy resources) in a much more systematic way than has been done to date. Environmental assessment may well delay energy projects whose primary aim is to reach foreign markets, but such delays are still far more palatable than

they would be were the projects' output perceived as necessary to meet domestic household and industrial energy demand. In addition, to reiterate a point made earlier, it will be very difficult for Canada to make any credible commitment to the energy efficiency goals of the Brundtland report while continuing not only to be one of the world's highest per capita consumers of energy, but also to actively promote the products of its energy industries both domestically and internationally.

## INDUSTRY AND ENVIRONMENT: THE CASE FOR LONG-TERM PLANNING

To many Canadians, the most familiar aspect of environmental policy is the regulation of industrial pollution to protect environmental quality and public health. Substantial gains have been made in this area over the past couple of decades. At the same time, complacency is clearly premature in view of the continued discharge of toxic substances into the biosphere and the incomplete but disturbing evidence of, for example, the adverse effects of toxic pollutants and combinations of pollutants on the health of forest and aquatic ecosystems.[64] The details of these problems cannot possibly be provided here; in the present context it may be more important to note that the basic political economy of industrial pollution problems remains largely unchanged. Like many other threats to sustainable development, they are a consequence of failure to properly price the use of the environment. Traditionally, industry (and, for that matter, individual households) have enjoyed the use of air, water and (to some extent) land as "free goods" for purposes of waste disposal, resulting in precisely the sort of overuse one would expect. Setting an appropriate price for use of other resources, like forests or water, results in more consideration being given to economy of use, so pricing the use of the environment through pollution control requirements can be expected to result in more economical use of the environment.

This admittedly oversimplified analysis suggests that here, again, the structural weakness of the Canadian economy is important. Among the most serious polluters are resource-related industries, but firms in these industries are often the principal economic support of single-industry communities. This gives them a powerful bargaining advantage in resisting the internalization of waste disposal costs. In such situations, governments often respond to public demands for pollution control measures by financing at least part of the needed investment from the public purse. Recent federal and provincial programs of pollution abatement subsidies for Canada's non-ferrous smelting and pulp and paper industries have cost taxpayers roughly $1 billion,[65] in addition to the value of the tax expenditure on fast writeoffs for pollution abatement equipment, worth approximately $1.4 billion (current dollars) between 1969 and 1981.[66]

Such subsidies raise at least two important issues. First, pollution abatement subsidies fail to change the existing allocation of rights to the use of the environment. The public is still bearing the externalized costs of industrial production, but instead of bearing them in the form of a degraded and perhaps hazardous environment, it is "buying back" environmental quality via subsidies for pollution abatement. As an alternative to public subsidy, firms might be expected to finance the needed investments by issuing additional equity. Their balance sheets would not suffer the deterioration caused by additional borrowing, but the cost of past inattention to environmental concerns would be borne by existing shareholders, as dilution of their equity. Perhaps non-exploitative or non-destructive resource users should have a lower priority than industrial, consumptive users of the environment. But such allocations of rights to the use of resources should be the topic of explicit, and candid, debate within the political process.

Second, and more importantly in the specific context of the Brundtland report, little or no attention appears to have been paid in the design and implementation of industrial policy to the long-term congruence of environmental protection and

industrial competitiveness as objectives of public policy. It is now clear that in many industries process modifications which reduce pollutant emissions also reduce production costs by reducing energy requirements or recovering usable materials.[67] So-called non-waste technologies will not solve all problems of industrial pollution. Neither does the existence of offsetting economic benefits to the user of the technology (from, **e.g.**, materials recovery or reduced energy costs) necessarily mean that such technologies will "pay for themselves" by providing a higher rate of return than alternative new capital investments - a point sometimes forgotten by enthusiasts of non-waste technology. However, plant modernization will often both pay environmental dividends and improve the cost position of the plants or industries involved. The Brundtland report notes that new, closed-cycle pulp and paper mill technology uses only one-sixth as much water per ton of pulp as do mills built before the 1970s, and that water "recycling" can similarly reduce water consumption in the steel and chemical industries.[68] An inventory of discharges from major industrial polluters in Ontario shows that effluent volumes from relatively new petroleum refineries and steel plants are only a small fraction of those from older plants of comparable capacity.[69] And the Swedish steel-making processes used by Goldemberg's team in projecting industrial energy requirements for developing countries offers major advantages over existing processes not only in energy economy, but also in reduced environmental impacts.[70]

As a further example, the 1984 report of a special Parliamentary committee on acid rain pointed out that "process changes in a number of smelters can significantly reduce $SO_2$ emissions and still be justified on purely economic grounds. In other words, the portion of cost which is attributable to $SO_2$ control can, in some instances, approach zero."[71] The rationale for abatement subsidies in such situations is questionable, to put it mildly. One of the objectives of another such subsidy program, the Pulp and Paper Modernization Program, was to improve the technologically obsolete physical plant of this important industry - the result of low rates of capital investment throughout the 1970s.[72] However, the program appears to have taken as given the preservation of existing facilities, even when their modernization was not economically viable without grant assistance. Perhaps as a result, the industry has not undergone the kind of restructuring needed to keep it competitive with Finland or Sweden.[73] It may well be that closing down some facilities within industries like pulp and paper is inevitable, and public expenditure should be geared to facilitating the transition rather than resisting it. In this context, the chairman of Crown Forest Industries Ltd. was quoted in 1985 as saying that: "If the only thing that can prevent a mill from being shut down is a big government grant, our position is that the money would be better spent to train and relocate those workers."[74]

These examples are cited to illustrate the point that at least in rich countries like Canada, industrial policy and environmental policy confront two common problems. The first of these is that of mobilizing needed capital investment without offering inequitable and fiscally destructive levels of public subsidy. A pessimistic view is that the general increase in inter- and international competition for investment means that governments will face intensified pressure from business for direct and indirect subsidies. Particularly in a time when high budget deficits create a need for financial restraint, simple considerations of fiscal responsibility suggest that subsidized industrial capital investments should meet standards based on the current state of the technological art in terms of productivity improvements, pollution abatement performance and resource economy. Many existing programs of support (in

particular, the tax subsidy for investment in manufacturing and processing) are blunt instruments ill-suited to this planning function. It must always be clear that the needed investment is beyond the capabilities (as distinct from simply the preferences) of the owners of the firms in question. And industrial policy must take into account long-term objectives of environmental protection and resource economy, as one way of avoiding the short-term focus on remediation, damage control and end-of-pipe reductions which is typical of today's environmental policy.[75]

Programs of aid for capital investment should also not serve as a way of postponing structural adjustments or complete replacement of plants which are necessary to maintain domestic and international competitiveness, just as relaxations or extensions of environmental control requirements should not do so. This suggests the second problem common to environmental and industrial policy: that of making the transition away from declining, or environmentally unacceptable, firms and industries as humane and economically painless as possible for the individuals whose livelihoods are affected. Canada's record in this respect is unimpressive, as illustrated by governments' continued defence of the asbestos mining industry[76] and by the economic hardships routinely faced by displaced workers in economically mature industries.[77] "... as we are faced with employment dislocation, our only policy seems to be to try to drive the productive machine that much harder ..."[78] If the costs of technological transitions cannot be minimized for the workers and communities involved, such transitions will be strongly resisted. This resistance is perfectly understandable. People whose economic status is strikingly privileged relative to industrial workers act the same way: doctors organize partial withdrawals of services in response to policies which threaten their status as independent professionals, and negotiate substantial and routine upward adjustments in provincial medical insurance fee schedules; university professors complain bitterly about any erosion of the unique economic security provided by the institution of tenure. Yet Canadian society's inability to manage technological transitions has potentially disastrous consequences, both for economic competitiveness and for the environment. Imaginative policy initiatives in this field are urgently needed.

Needed as well are new approaches to implementing and enforcing environmental requirements. If subsidies and tax breaks are sometimes an essential carrot, sanctions which reliably and consistently impose a price for the use of the environment are almost always an essential stick. However, the uncertainties built into in the current "command-penalty" structure of environmental law mean that the actual price is often zero, or negligible. The Brundtland report[79] stresses the more effective use of economic instruments to induce the internalization of costs of industrial production. Many Canadian economists have urged the use of policy instruments like effluent charges, surety bond requirements or delay penalties to price use of the environment more reliably and consistently;[80] so far, they have had little impact. The cynical view is that the use of such policy instruments has been rejected because they would work too well, imposing costs on polluting firms which would lead to overt conflict with government. The alternative view is that policy-makers simply do not understand the nature of the problems and the flaws in current legal attempts at solving them, or prefer symbolically powerful initiatives (like extremely high maximum fines for polluters) which ignore the practical realities of prosecution and sentencing. But there is little excuse for such ignorance, particularly since at least one piece of federal legislation, and a relatively old one as environmental

statutes go (the **Canada Water Act**) makes explicit provision for the levying of effluent charges.

A final point about the relationship of industry and the environment must be made. An underlying theme of the Brundtland report, as of many other recent works on environment and development, is that rapid economic growth is needed to alleviate the poverty which is both a direct and an indirect cause of environmental destruction. Economic growth in developing countries is not just compatible with environmental protection; it is **essential** to environmental protection. In Canada, there is a subtler, perhaps analogous and certainly no less important relationship between growth and sustainable environmental and resource policies. Much of the current pressure on Canada's resource-related industries to "deliver the goods", even at very high environmental costs, is due simply to the absence of economic alternatives. Despite our tremendous aggregate national wealth, millions of working Canadians remain economically insecure and dependent for their livelihood either directly or indirectly on resource industries. In addition, political power with respect to decisions about natural resources is highly decentralized, and few institutions exist which can articulate a coherent long- (or even short-) term national interest in this area. Thus, "industrial strategy" emerges as an environmental necessity to the extent that it offers the possibility of expanding, and diversifying, the range of economic opportunities accessible to Canadians. In other words, if we cannot develop and implement an industrial policy that works in these terms, as well as easing the movement of workers among industries and sectors, we are unlikely to be able to implement environmental policies that work in terms of any serious set of criteria of sustainability.

## ARMS, AID AND THE WORLD

The connection among militarization, environment and development can be made at several levels. In addition to the human carnage which is the consequence of warfare, its impacts on the environment are often severe, even when environmental destruction is not being used deliberately as an element of strategy, as it was by the United States in Indochina.[81] In view of the many armed conflicts now raging within and between developing countries,[82] this is a point of considerable significance. In addition, military activities consume substantial volumes of many natural resources, notably fossil fuels and metals, in profoundly unproductive ways.[83] But perhaps most significant is the tremendous waste of money, scientific and technical talent, and other human resources represented by spending on arms and armies. The Brundtland report provides yet another condemnation of "... the coexistence of substantial military spending with unmet human needs." It notes that: "Global military spending in 1985 was well in excess of (US) $900 billion. This was more than the total income of the poorest half of humanity," and that such levels of spending emerge as particularly absurd when compared with the modest expenditures which would be needed to implement such programmes as an Action Plan for Tropical Forests, the UN Water and Sanitation Decade, or the supplying of contraceptives to all women already motivated to use family planning.[84]

Some would argue that such comparisons are naive or impractical. They are neither; as we are so often reminded, public budgetary decisions must always weigh the relative merits of competing claims for limited resources. Rather, they are essential steps to understanding the fact that arms spending is the purest waste of economic resources, and that expenditures on arms constitute "theft on a global scale".[85] This point is not belabored further here, since ample evidence to support it has been provided by the Brundtland Commission and by any number of others, perhaps most notably the United Nations' Group of Governmental Experts on the Relationship Between Disarmament and Development.[86] What are its implications for Canadian public policy?

In 1986-87, Canada will spend about $9.7 billion on defence - more than four times the amount spent on official development assistance, and roughly one-quarter of all federal discretionary (that is, non-statutory) expenditures.[87] Despite professed concern about budget deficits, and despite the fact that Canada's per capita defence spending is higher than that of many European countries and only slightly lower than that of West Germany, the federal government now proposes two percent real growth in defence spending over the next 15 years, with higher increases in some years.[88] The planned procurement of nuclear submarines at a cost of $5 to $12 billion is a first instalment of this program. Given the problematic documented in the Brundtland report, are there not more pressing uses for scarce federal funds? And why, in the Canadian context, have military expenditures almost completely escaped the scrutiny that is routine when real increases are proposed in other fields of public expenditure?

The lack of such scrutiny may be partly explained by the fact that job-creation and reduction of regional economic disparities are mooted as major domestic benefits of increased defence spending.[89] Some within government may even view a program of capital spending on defence as a "magic bullet" to deal with the problem of unemployment in the 1990s, rather as energy megaprojects were viewed at the start

of the 1980s (and as electrical generation projects, at least, continue to be viewed today). Still more disturbing is the fact that proposed increases in Canadian arms spending are being defended on the grounds that they "allow us to take advantage of economic opportunities abroad in both defence and parallel non-defence industries." [90] The growth of the lucrative international arms trade has created a powerful vested interest on the part of many rich countries (and tragically, some poorer ones as well[91]) in increasing the diversion of resources to arms spending and perpetuating the spread of armed conflict.

Although Canada is (fortunately) a relatively minor player in this game, Regehr and Epps estimate that direct and indirect Canadian military sales to the Third World totalled $300 million in 1985.[92] Given Canada's weak manufacturing sector, the temptation to expand military exports is a powerful one,[93] but it must be resisted. One of the many laudable conclusions of the recent report on official development assistance issued by the House of Commons Standing Committee on External Affairs and International Trade (the Winegard report) is that:

> "Our aid should not allow any government to spend more on arms and less on basic needs than it otherwise would. In keeping with our own priorities and values [sic], Canada should ask questions and expect answers in the case of recipient countries whose governments' budget allocations put more emphasis on the military than on programs of social and economic welfare. More generally, because the issue of disarmament and development is a critical one that ultimately affects us all, the Committee urges Canada to take a leadership role in discussions of this subject in multilateral forums.
> Canada should also work with others to control the traffic in arms destined for developing countries."[94]

The same criterion should be applied to our policies toward domestic industries' export activities. If the recommendations of the Brundtland and Winegard reports are genuinely accepted, Canada will not only forego the economic benefits from additional arms sales to developing countries; it will actively attempt to prevent Canadian-based firms from engaging in such traffic. In addition, we would do well, for reasons of credibility if no others, to heed our advice to other countries in terms of our own expenditure priorities. Do our own government budgets, perhaps, put more emphasis on the military than on programs of social and economic welfare - or on programs which would ease the economic pressures working against sustainable resource policies?

The discussion leads logically to a more general discussion of Canadian development assistance and its direct and indirect environmental impacts in developing countries. Recently CIDA, Canada's bilateral aid agency, has been criticized for its lack of systematic attention to environmental and resource questions in project assessment and for its emphasis on supporting large industrial developments.[95] Similar, and indeed much sharper, criticisms have been levelled at the World Bank and other multilateral development banks, prompting a commitment by the World Bank to attach a higher priority to environmental issues in evaluating candidate projects for funding.[96] These criticisms touch on some fundamental problems associated with development assistance, and suggest the need for an overall environ-

mental impact assessment of Canadian aid policy - an assessment conspicuously absent from the Winegard report.

One problem is that of who really benefits from much aid spending. In 1985, Best noted that: "The fact that what is good for Canada's export ambitions may not always be what is best for the recipient nations, carries little weight in the current climate."[97] The issue is raised here both because of the possible adverse influence of tied aid on the environment - an issue which deserves far more detailed research - and because the persistence of tied aid helps in understanding the general political context for all forms of development assistance. The political payoffs from supporting collective altruism (giving money to poor nations because they need it) are few and far between. In the absence of substantial domestic income and employment benefits, development assistance would become the only substantial government expenditure program without any domestic political clients (apart from the minuscule development community, whose political efficacy is dubious at best). Under those circumstances a very high level of political leadership would be needed to preserve existing levels of development assistance, much less to increase them.

Few would now dispute the need for critical assessment both of the environmental impacts of specific aid-supported projects, and of the overall set of development priorities implicit in criteria for project support.[98] For example, the conventional, commercial tests which are often applied to the economic viability of development projects obviously contain (in addition to their other weaknesses) a built-in bias in favor of the externalization of environmental costs.[99] On the other hand, it is often claimed that aid donors' hands are partly tied because they are dealing with sovereign governments whose decisions about domestic priorities they must respect. It is doubtless true that the successful management of almost any aid project involves a complex and sensitive process of accommodation between donor agency and recipient government. However, the Winegard report (at last) challenges the validity of an arms-length approach to questions of recipient country domestic policy in the area of human rights, arguing that recipient governments' human rights records should be considered as a factor in determining aid eligibility.[100] A similar approach should be pursued with respect to many kinds of environmental problems. Unlike human rights violations, some instances of exploitative development in poor countries are the result of desperation, of the stark absence of economic options at the national level. However, many other such situations can be directly related to distributional issues.[101] Recent events in the Duvaliers'Haiti and Marcos' Philippines should suffice to remind us that developing nations are not homogeneous collections of the underprivileged. Rather, they are complex societies in which the distribution of wealth and of political influence and power is often drastically more unequal than in our own. It is hardly coincidental that Haiti and the Philippines are two of the poor countries where deforestation and its associated environmental impacts have been most devastating; the connection between inequality and deforestation is clearly evident in a number of other developing countries.[102]

There are no simple answers to the question of how aid agencies should deal with such problems. A recent study of CIDA's experiences with aid programs in Haiti explains the Haitian government's relative indifference to aid efforts by noting that: "Improving rural living standards and rural education offer little obvious benefit to the urban elite and are potentially revolutionary in their longer-term implications."[103] But distributional issues cannot be ignored. Aid agencies must be

particularly scrupulous in ensuring that they do not directly or indirectly support projects whose environmental consequences are disproportionately borne by the poor or otherwise powerless, or which actually make some people worse off, for the poor and powerless are often the principal victims of ecologically destructive policies, programs and projects. Conversely, programs which specifically (and effectively) aim to improve the lot of the poorest people in poor countries may have important indirect environmental payoffs through reducing the desperation, typified by the cutting for fuelwood of trees which are the major defence against soil erosion and desertification,[104] which often leads to ecological degradation. If Canada can deal effectively with the concerns expressed in the preceding paragraphs, it has the opportunity to provide essential help to sustainable development in the poor countries by contributing to the added financial flows which the Brundtland Commission[105] views as essential to the reduction of poverty and the promotion of sustainable development. If Canada cannot do so, to put the issue quite bluntly, it faces a future of being part of the problem rather than part of the solution.

## CONCLUSIONS AND REFLECTIONS

Obviously, one of the themes of the Brundtland report is the compatibility of economic growth and environmental protection. It could be concluded on this basis that great strides in resource management will be achieved simply by applying the principles of economics to resource management, and from evaluating the benefits of environmental protection and resource economy in terms of conventional economic criteria, for instance through the use of cost-benefit analysis and proxy measures of willingness to pay for environmental quality or resource preservation.

This approach has some features which are undeniably attractive. For example, constant reminders are needed that a resource whose price is artificially low will be overused, and that more extensive use will be made of a resource when consumption is not priced than when it is; household water consumption and industrial water pollution are two cases in point. Cost-benefit analysis, even at a rudimentary level, requires that analysts (and those using the analysis) clearly distinguish the **private** costs and benefits - on the basis of which most individual producers, individual consumers, and firms make most of their economic decisions - from **social** costs and benefits. The process of quantifying social costs also requires acknowledging the existence of externalized costs, like those of environmental damage, which are often ignored or dismissed as trivial. The damage estimates for soil degradation cited earlier in this paper are an example of the power of such attempts at cost valuation.

Yet there are compelling reasons for skepticism about cost-benefit analysis. Among many other failings, it is notoriously sensitive to even small changes in underlying assumptions, creating a clear temptation for manipulation in the service of corporate or institutional self-interest.[106] The practice of discounting future benefits, although unexceptionable in economic terms, results in an inescapable bias toward the short term - an implicit, cornucopian assumption that things will work out.[107] And cost-benefit analysis, like the efficiency criterion which underlies it, is indifferent to issues of distribution. This failing is of particular importance in developing countries, since rapid economic growth which generates huge benefits for the wealthy may well be accompanied both by widespread impoverishment and by destruction of the environment which must support the majority of the population.[108] Acknowledging the importance of ecology-economy linkages should mean re-evaluating economics in terms of the principles of ecology, rather than the other way around.[109]

A further trap to be avoided is the belief that since economic growth and environmental protection are compatible, there are therefore no "real" conflicts between the two. The frequency and (sometimes) bitterness of conflicts between jobs and environmental protection, even in a rich country like Canada, suggests the Panglossian nature of this belief. There will **always** be "losers" in competition among users of resources, whatever the long-term nature of the relationship between economic activity and environmental quality (broadly defined). The real issue may be the question of distributional equity identified at the start of this paper. To state the situation plainly, having degraded one particular environment, or reached the economic limits of one particular resource base, the wealthy can almost always build walls or go elsewhere, whether "elsewhere" is a cleaner neighborhood or another country. The poor cannot do so - hence Enzensberger's trenchant observation that: "The ecological movement has only come into being since the districts which the

bourgeoisie inhabit ... have been exposed to those environmental burdens that industrialization brings with it. What fills their prophets with terror is not so much ecological decline ... as its universalization."[110] It is thus particularly important both to recognize that distribution of costs and benefits is a basic aspect of all environmental policy choices,[111] and to ensure that the poor or powerless within a given society not be made to bear disproportionate additional costs associated with policies aimed at promoting environmental protection or sustainable resource management practices. Very seldom are such considerations explicitly recognized in any systematic fashion.

One of the questions faced by Canadians, as suggested many times in this paper, is whether our social and political institutions are adequate to making decisions and choices on the long-term basis which is necessary if public policy is to address ecology-economy linkages seriously. In many respects, they have so far proved inadequate to this task. Our prescriptions for change will not be taken very seriously (nor should they be) when they emanate from a country which has not been willing or able to implement them domestically in the relative comfort and political flexibility which are the accompaniments of wealth. We may be shocked to hear that "in all of Latin America it is estimated that less than ten percent of municipal sewage is treated,"[112] but we should remember that fewer than ten percent of the households in Canada's second largest province are served by sewage treatment.[113] We should consider Canada's status as one of the world's highest per capita consumers of energy - surely not entirely the result of long distances and long winters.

Any serious discussion of development issues reflects some implicit or explicit resolution of the tension between utopianism and self-censorship suggested by the quotations which introduce the paper. So far, numerous hard choices have been identified, but little attempt has been made to address questions of implementation. These are particularly important for a federal agency, since provincial control over many aspects of natural resource management seriously constrains the role of Canadian national governments. This constraint need not prevent effective federal advocacy in support of environmental objectives, as illustrated (for example) by the Macdonald Commission's strong recommendations on provincial forest policy.[114] And it is not suggested here that the federal role can or should be limited to one of advocacy, particularly since many federal programs and activities which are not at all "environmental" in nature nevertheless have important impacts in this area.

As just one example, to the author's knowledge no detailed assessment exists of how the corporate income tax system affects resource economy by way of its impact on investment decisions. Dixon Thompson points out that the high value of corporate income taxes deferred as a result of tax measures to reward investment creates a strong general incentive for continued capital-intensive development, whether or not it is economically or environmentally appropriate on its own.[115] The importance of such questions is suggested by the fact that the accumulated value of deferred corporate income taxes in 1984 was more than $31 billion, more than half of which was accounted for by resource industries (mining, oil and gas production, paper, primary metals, and integrated oils).[116] To quote Thompson again, "... any government serious about ensuring that our renewable resources are on a sound footing in perpetuity would adjust those tax policies for which they were responsible so that conservation and environmental protection make good economic sense at least from the taxation perspective."[117]

But how to bring such changes about? One answer may be to create the office of an Environmental Auditor-General, who would attempt to inform and catalyze public opinion with respect to the resource implications of government programs, much as the federal Auditor-General's Department now attempts to do with respect to the public's receipt of value for money spent by government. This function could, in turn, constitute a major element of the mandate of a national Environmental Advisory Council whose creation is recommended by the Macdonald Commission.[118] Such an organization already exists, of course, in CEAC, but its budget and staff need to be expanded severalfold if it is to be effective. In addition, the Council's mandate must not be restricted, as the Macdonald Commission suggested, to "hazards that are of high national or regional priority"; rather, it should include assessing the environmental and resource impacts of government policies and programs in general, including development assistance. Along the same lines, the Macdonald Commission's call for statutory entrenchment of environmental assessment at the federal level[119] should be acted on with all due haste, with the added and familiar proviso that assessments must focus not only on the impacts of specific projects, but also on government programs and on the cumulative environmental and resource impacts of development strategies.

Recommendations like these, admittedly, seem out of phase with the gravity and magnitude of the problems isolated in the Brundtland report; indeed, they are no more than first steps. Over the longer term, the problems identified by the Brundtland report will require nothing less than changes in the fundamental organizing principles of many sectors of the Canadian economy, and of the government policies which address those sectors. It is clear that serious engagement with such problems will mean abandoning "practicality," in MacKinnon's sense: there are few fixes which can be implemented while keeping everything else the same. Can we be convinced- and, most important of all, can we convince our political leaders - that this is a challenge to Canadians' collective creativity rather than a reason to retreat into defence of a status quo which is increasingly becoming unworkable?

It is interesting that the Brundtland report has appeared ten years after the publication of the Science Council's report on **Canada as a Conserver Society**. Many of the central ideas of that report have now reappeared, with the added sophistication and tough- mindedness that results from ten years of scientific, professional and popular discussion of the question of sustainable development and from the fragile, but expanding dialogue between rich and poor countries of which the Brundtland Commission is itself an example. The 1977 Science Council report was especially notable for the challenge it presented for political leaders. "Unfortunately," it said, "the future has little economic or political power. It has no votes. The government in power, which is a surrogate for the country itself must take the longer view. It is the responsibility of the government to ensure that future citizens are provided with options."[120] Common to most of the problems outlined in this paper, and to many others in the area of environmental protection and resource economy, is the inability or unwillingness of governments to do this. If the directions for public policy identified in the Brundtland report are to be taken seriously, this will have to change.

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ANNEX 6

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K1A 0H3